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Sedentariate and archiannelid polychaetes

of British Columbia and Washington

Katharine D. Hobson • Karl Banse

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SEDENTARIATE AND ARCHIANNELID POLYCHAETES OF BRITISH COLUMBIA AND WASHINGTON

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BULLETIN 209

Sedentariate and archiannelid polychaetes

of British Columbia and Washington

KATHARINE D. HOBSON†

Aquatic Zoology Division
Provincial Museum
Victoria, B.C. V8W 1A1

KARL BANSE

Department of Oceanography
University of Washington
Seattle, WA 98195 USA

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The authors' initials indicate the principal scientific responsibility for each family except MLJ (M. L. Jones) for the Magelonidae

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The Bulletin concerns the sedentariate and archiannelid polychaetes of British Columbia and Washington, the northern section of the Oregon Biogeographic Province. A checklist of the 273 species known from landward of the 200-m isobath indicates those species for which we have seen local specimens. Brief instructions for collection, identification, and use of the illustrated keys are given. A tabulated scheme summarizes the principal external diagnostic characters of the families. Keys to all genera from the continental shelves of the cold–temperate North Pacific are provided under the relevant family. The species keys identify the species known from British Columbia and Washington and an additional 19 species, which may be expected there. The diagnostic characters are presented in a series of alternative choices but supplemental characters are added to preclude accidental misidentification of species not yet recorded from British Columbia and Washington but known from elsewhere in the cold–temperate North Pacific. Several new referrals and records are reported. The Bulletin contains about 400 detailed figures.

The waters of British Columbia and Washington share 45% of their benthic polychaete species (including errantiate taxa) with the shelf off southern California, i.e., the northern part of the San Diego Biogeographic Province. The commonality is similar to or less than that of the mollusks of the same region. British Columbia and Washington have about 45% of their benthic polychaetes in common with the cold–temperate Northwest Pacific biogeographical provinces as a whole.
Key words: Polychaeta, taxonomy, identification keys, geographical distribution.

Résumé

HOBSON, K. D., AND K. BANSE. 1981. Sedentariate and archiannelid polychaetes of British Columbia and Washington. Can. Bull. Fish. Aquat. Sci. 209: 144 p.

Le présent Bulletin est consacré aux polychètes sédentaires et archiannélides de la Colombie-Britannique et de l'État de Washington, la section septentrionale de la province biogéographique de l'Oregon. Une liste des 273 espèces connues habitant des profondeurs de 200 m et moins comprend les espèces dont nous avons vu des exemplaires locaux. Nous donnons de brèves instructions pour la collecte, l'identification et l'usage de clés illustrées. Un tableau résume les principales caractéristiques diagnostiques externes des familles. Pour chaque famille, nous présentons une clé de tous les genres provenant des plateaux continentaux du Pacifique nord froid-tempéré. Les clés des espèces permettent d'identifier les polychètes connus de la Colombie-Britannique et de Washington, ainsi que 19 autres espèces qu'on peut s'attendre de trouver dans cette région. Les caractères diagnostiques sont donnés en une série de choix. Nous y ajoutons des caractères supplémentaires afin de prévenir une fausse identification d'espèces non encore signalées en Colombie-Britannique et Washington, mais connues ailleurs dans le Pacifique nord froid-tempéré. En plus de contenir plusieurs références et mentions, le présent Bulletin est illustré d'environ 400 figures détaillées.

Quarante-cinq pour cent des espèces de polychètes benthiques (y compris les taxa errants) des eaux de la Colombie-Britannique et de Washington se rencontrent également sur le plateau continental au large de la Californie méridionale, i.e. la partie septentrionale de la province biogéographique de San Diego. Cette présence commune est à peu près semblable ou est inférieure à celle des mollusques de la même région. La Colombie-Britannique et Washington possèdent environ 45% de leurs polychètes benthiques en commun avec les provinces biogéographiques du Pacifique nord-ouest froid-tempéré, prises dans leur ensemble.

Introduction

Scope of Work

This Bulletin is the second and final volume summarizing the taxonomic knowledge of the polychaetous annelids recorded landward of the 200-m isobath of the continental shelf of British Columbia and Washington. The sedentariate and archiannelid species are treated herein, whereas the first volume (Banse and Hobson 1974) covered the benthic errantiate forms.

The main purpose of the work, as that of the first volume, is to provide a means of identifying benthic polychaetes from British Columbia and Washington; here, as elsewhere, these annelids contribute a significant fraction of the number of species and biomass of the animals larger than 0.5–1.0 mm (Banse and Hobson 1974). Biogeographic remarks are made for the region that forms the northern part of the cold–temperate Oregon Province (Briggs 1974). The recent history and state of knowledge of the polychaetes of the province are reviewed, and comparisons with other temperate North Pacific provinces attempted. The biogeographic section is followed by references to methods of collection, fixation, and identification, and by advice on using the keys. A checklist of the species known to occur on the continental shelves of British Columbia and Washington is provided. The species of which the authors have seen specimens collected in the region are set in bold face in the checklist.

The principal external characters of the families of sedentariate and archiannelid polychaetes are summarized and keys to all genera known from the continental shelves of the cold–temperate North Pacific Ocean given. To be consistent with the layout of the first volume, we continue to delimit the area covered by Point Conception on the California coast to the south and by latitude 36°N off the Pacific coast of Japan; we include also the Sea of Japan, except for the coast of Honshu west of the Noto Peninsula and the southern coast of Korea. We allowed ourselves some latitude in deciding which genera to identify, because cold–temperate forms may show submergence and occur south of the indicated borders in cooler water on the deep parts of the shelves. The poleward coverage of the keys extends beyond the limit of the cold–temperate North Pacific Ocean and comprises the northern part of the Sea of Okhotsk and Point Barrow, Alaska. The species keys, in contrast to the generic keys, treat only species of British Columbia, Washington, and immediately adjacent areas (essentially Oregon) recorded landward of the 200-m isobath. Of the 292 species or subspecies incorporated in the keys, 273 are now known to occur in British Columbia and Washington.

The principal scientific responsibility for each family is indicated in the table of contents. K. D. Hobson had drafted the generic and specific keys for the families she was to be responsible for, as well as the family key, and had prepared the majority of the drawings for them. We had extensively consulted about the text so that the scientific content was agreed upon by the time she passed away (Sept. 19, 1975). Further, she had used rough versions of the keys for the other major families, except the Cirratulidae and Maldanidae, in her examination of the large collections in the British Columbia Provincial Museum and improved these drafts. After her death, the changes made in the families designated by her initials mainly concerned the choice of phrasing, for example, in the keys. Changes in scientific content were largely restricted to the family key, the Spirorbinae, and a revision of the key for the Spionidae. Also the introductory material was more recently prepared. Finally, the key and figures for the Magelonidae were contributed by M. L. Jones.

History and Present Knowledge of the Polychaete Fauna

The first comprehensive keys for the area were those by Berkeley and Berkeley (1948; 1952); they treated 295 benthic species for British Columbia. The Berkeleys chose to omit the few additional species recorded from Friday Harbor, just outside the limits of the political entity of British Columbia, and from other Washington localities. Thus, the known benthic polychaetes of British Columbia and Washington in 1948/1952 comprised just over 300 species. However, appreciably more species had been collected from the area but could not be identified easily when the present authors and F. H. Nichols (now at the U.S. Geological Survey, Menlo Park CA 94025) participated from the mid-1960s onwards in the benthic studies of U. Lie (now at the Institute of Marine Biology, University of Bergen, N-5065, Blomsterdalen, Norway).

For British Columbia during this period, C. Berkeley tabulated 164 errantiate benthic taxa (1967) and 186 sedentariate and archiannelid taxa (1968), i.e., a total of 350 species. The lists included some records for Washington, as well as from beyond the 200-m line, and were not strictly comparable to Berkeley and Berkeley (1948; 1952) or to the present work.

The checklists in Banse and Hobson (1974) and the present volume contain 195 and 273 taxa, respectively, i.e., a total of 468. To this number may be added species identified in these keys only to genus; new errantiate records (Armstrong et al. 1977; Armstrong and Jumars 1978; Kravitz and Jones 1979); two or three unidentified errantiate species in the British Columbia Provincial Museum; three new records in Knight-Jones et al. (1980); and almost 10 unpublished records by others at the Friday Harbor Laboratories, University of Washington. Including these, the polychaete fauna of British Columbia and Washington as known to the 200-m isobath of the continental shelf comprises approximately 495 species. In addition, 15 species (13 starred in these keys; two in Knight-Jones et al. 1980) have been found both to the north of British Columbia (including the Bering Sea) and to the south of Washington and, thus, are very likely to occur in local waters too.

It is difficult to estimate how well known the polychaete fauna of British Columbia and Washington is now. During the last 10 yr, rather large species (e.g., of Nereidae and Maldanidae) and common, mediumsized forms (e.g., *Hobsonia florida*) were newly found in the intertidal; *H. florida* is not a recent immigrant as it seems to have been common in 1940 (Banse 1979b). Further, certain less accessible habitats, e.g., holdfasts of subtidal algae and the open continental shelf, have not been well studied. In fact, a small-scale sampling program on the shelf off the mouth of the Columbia River by Kravitz and Jones (1979) yielded several new records and species of Phyllodocidae. In contrast, large collections off Oregon (Carey 1972), focused on the outer shelf and the continental slope, did not add a material number of new records.

The polychaete fauna of the southern part of the Oregon Province is less known than that of British Columbia and Washington (see Hartman 1968, 1969 for northern and central California). Relatively well-studied families contain a significant number of species not reported from the northern part of the Oregon Province. For example, in addition to the 20, 37, and 31 species, respectively, of Ampharetidae, Terebellidae, and Sabellidae found in waters of British Columbia and Washington, or to be expected because of records both to the north and in the southern part of the province, one (two?), five (six?), and six species occur only in the southern part of the Oregon Province (inside the 200-m isobath; principally from Hartman 1969); these three families contain larger and often conspicuously colored species, thus reducing sampling bias. In other words, the southern part of the Province contributes about one-eighth of the total, and the total polychaete fauna of the entire Oregon Province may exceed 550 species. This number surpasses somewhat that for southern California, i.e., the northern part of the San Diego Province (Table A).

Comparison with Other Temperate North Pacific Provinces

In the first volume, we followed earlier views about the biogeographic divisions of the North Pacific Ocean and considered the waters of British Columbia and Washington to be parts of a cold–temperate Oregonian–Aleutian Province. Briggs (1974) reviewed new evidence that confirms an important faunistic break in the area of the northern border of British Columbia (i.e., Dixon Entrance, about 55°N) and the tip of southeastern Alaska. Thus, Briggs distinguishes an Aleutian from an Oregon Province. The latter extends to Point Conception on the Californian coast and joins to the south the warm–temperate San Diego Province, which extends to southern Baja California. The cold–temperate, western North Pacific region covered by the generic keys comprises three biogeographic provinces (Briggs 1974).

Few polychaete collections have been made in the Aleutian Province, and these usually focused on larger species. Therefore, for the eastern North Pacific Ocean, only a comparison with polychaetes of the northern, well-studied part of the San Diego Province (i.e., the shelf off southern California) is possible (Table A). An additional comparison is attempted with the shelves of the cold–temperate Northwest Pacific as a whole as delineated on p. 4 (Table B). For the northern San Diego Province, records from the intertidal, estuaries, and the shelf in Hartman (1968; 1969) were counted so that a few species collected in the upper regions of the canyons were excluded. We believe our species concept is markedly influenced by Hartman's work, so the comparison of the two provinces is particularly appropriate. For the Northwest Pacific, only the families or lower taxa recently revised in that region were reviewed (Imajima 1967, 1969, 1972, 1973, 1976; Imajima and Higuchi 1975; Strelzov 1973; and Ushakov 1972). Additional records for these families, principally from Chlebovitch (1961), Imajima and Hartman (1964), and Ushakov (1955), were included. For both comparisons, the names and records were mostly accepted as given. All species in the checklist herein and in Banse and Hobson (1974) (including the queried names) were regarded as members of the shelf fauna of British Columbia and Washington, as were those species starred in our keys that were recorded both to the north and to the south

TABLE A. Comparison of polychaete records in the northern parts of the Oregon and San Diego provinces (largely families with $\geq$ 10 species in either province).

	N. Oregon Province		N. San Diego Province
taxon	records	% in common with N. San Diego	records
Polynoidae	30	40	25
Phyllodocidae	27	44*	23
Syllidae**	35	57	37
Nereidae	18	56	18
Nephtyidae	13	54	12
Onuphidae & Eunicidae	9	67	30
Lumbrineridae	13	85	19
Orbiniidae	10	70	9
Spionidae	33	45	35
Cirratulidae	13	62	17
Opheliidae	10	40	10
Capitellidae	12	42	12
Maldanidae	27	37	17
Ampharetidae	20	55	13
Terebellidae	37	32	21
Sabellidae	31	26	20
Serpulidae	21	19	16
All benthic families**	471	45	453

*Lower if including records by Kravitz and Jones (1979).

**Without Autolytinae.

of British Columbia and Washington. The Autolytinae and the archiannelid families were excluded as obviously they were studied with differing attention in the various areas.

Of the 471 species from British Columbia and Washington considered here, 210 (45%) have been found also in the northern San Diego Province. The number of common species is 46% of the San Diego fauna. The percentage varies greatly among the families (Table A) so that the confidence

TABLE B. Comparison of polychaete records in the northern part of the Oregon Province and the cold–temperate Northwest Pacific.

	N. Oregon Province		NW Pacific
taxon	records	% in common with NW Pac.	records
Phyllodocidae	27	52*	24
Syllidae**	33	39	46
Nereidae	16	50	27
Sphaerodoridae	4	75	4
Lumbrineridae	13	23	11
Paraonidae	12	50	17
Hydroides	0	0	4
Totals	105	45	133

*,**See footnotes, Table A.

limit about the value of 45% must be large. The commonality of the northern Oregon fauna with that of the Northwest Pacific, as percentage of the Oregon fauna, is also 45% (Table B). Again, there is considerable variation from family to family.

It must be remembered that the arbitrary defining of the seaward borders of the provinces by the 200-m isobath may affect the calculated commonality of the Oregon Province with warm–temperate regions. Below the shelf break off southern California, submergence of northern Oregonian forms is apparent for 31 polychaetes (not in Table A; from distributions labeled by O, B, C, or A in Hartman 1968; 1969). Submergence can be expected also on the outer shelf above 200 m but below the mean depth of the principal thermocline. In other words, the distributional information available for our study is not fully adequate to the question asked, because the proper depth limitation of the San Diego Province might be landward of the shelf break. Further, northern forms in the San Diego Province may be tied to pockets of cool, upwelling water that are often observed near capes along the southern California and Baja California coasts (reviewed in Briggs 1974). Both effects would reduce the percentage of species in common between the northern Oregon Province and the warm–water areas of the San Diego Province.

Because of the inadequate knowledge of the fauna of the Aleutian Province and the uneven distribution of sampling effort within the Oregon Province, the degree of endemism among the polychaetes in the latter cannot be evaluated. For the same reason of inadequate sampling, biogeographic patterns within the province cannot be described for the polychaetes beyond the occurrence of additional species in the southern province mentioned above. Zoogeographic differences within the Oregon Province, however, are well known and one of the reasons that zoogeographic divisions on the North American west coast were disputed for a long time (Valentine 1966; Brusca 1973). Many authors even noted faunistic differences between Washington and British Columbia (for the outer coasts, e.g., Valentine 1966; for the fjord system, e.g., Cameron and Mounce 1922; for fishes, A. DeLacy and B. S. Miller, both of the College of Fisheries, University of Washington, Seattle, WA, 98195, personal communication).

Previously, polychaetes were believed to be more widely distributed than species of other major groups (e.g.,Ekman 1953: 13, 224; Fauvel [in Grassé 1959]; Thorson 1961). More recently, Kohn and Lloyd (1973) suggested the same for the 43 polychaete species known from Easter Island at that time. However, the view of "notoriously widespread" polychaete worms (Day 1973: 2) is not borne out by a comparison of the polychaetes of the temperate North American west coast and the mollusks well studied here. Valentine (1966) obtained a Jaccard coefficient of 0.38 for the mollusks between the Californian Province (very close in extent to the northern part of San Diego Province, here) and the entire Oregonian Province, delineated like the Oregon Province in Briggs (1974). The polychaetes shared by the northern parts of the Oregon and San Diego Provinces yield a coefficient of 0.30, and show less commonality than the mollusks. However, the coefficients for the latter and, hence, the similarity, were greater than the above value between the California Province and the southern part of the Oregonian Province (Valentine 1966: table 1). Therefore, the mollusk coefficient for the comparison, as here between the northern parts of the Oregon and San Diego Provinces, must have been lower than 0.38. To judge from the variability of coefficients among the individual polychaete families, it seems unlikely that the mollusk value would differ significantly from the overall polychaete coefficient of 0.30.

Collection and Identification

Some suggestions for obtaining and treating polychaete samples were given by Banse and Hobson (1974). Fauchald (1977), among others, provided additional advice, and especially emphasized pitfalls to be encountered when separating animals from sandy or muddy sediments. For the laboratory work, we repeat that care must be exercised when sorting samples that contain formalin: the aldehyde is also poisonous to man so that long-term exposure to the vapor should be avoided. Fortunately, formalin fixes proteins so well that even leaving the samples overnight in tap water at normal or low room temperatures will do little harm to the animals. Therefore, it is sufficient to work with dishes barely (or not at all) smelling of formaldehyde.

Banse and Hobson (1974) or Fauchald (1977) may be consulted for the technical aspects of identification. We reemphasize that very few details of setae can be seen without dissection. When it is necessary to study setae in frontal view, the excised torus or setal sack may be mounted in sufficient fluid under a coverslip so the torus is not flattened. If too much is excised or the uncini are withdrawn, the preparation should be torn apart with needles. To obtain setae in side view, press the coverslip with the thumb to flatten the preparation. If that is not sufficient, maceration in KOH or a household bleach like clorox is recommended, but setae may swell in KOH.

Failure to use magnification high enough to study setae is probably the most common technical reason for misidentification of polychaetes. Note that the size of the teeth at the vertex of an uncinus is often near the limit of optical resolution by the ordinary light microscope. The problem is ameliorated by viewing the setae in a medium with a low refractive index. Water with or without alcohol or glycerin are usually adequate. Strelzov (1973) employed a saturated solution of sodium acetate to observe fine details, following Söderström (1920) who introduced potassium acetate for this purpose. Phase contrast may also be used.

Permanent mounts of dissected parapodia or of entire, very small specimens can be made in a variety of ways. If a preparation in water or alcohol that is already under a coverslip is to be preserved, it often suffices to place a drop of glycerin at the edge; the drop will gradually be drawn under the slip. It is better, however, to mount the material directly in glycerin. In either case, the preparation is usable for a few years, particularly when ringed with fingernail polish to prevent accidental loss of the coverglass. Polylactophenol (one part lactic acid, one part phenol; transfer specimen from water or alcohol) may be similarly held under the coverglass. Note that the tissue will be slightly macerated by the reagent, and calcium carbonate (opercula of Serpulidae) will be dissolved.

More permanent mounts may be made in Polyvinyllactophenol (PVA) or Hoyer's medium (transfer from water or preferably 70% alcohol with water). For the former, suspend 8 g polyvinyl in 28 mL of 70% acetone with water. Mix 20 mL each of lactic acid and phenol (warming may be necessary) and add slowly to the first solution; then gradually add 40 mL of water. Heat in water bath until clear and viscous (A. J. Kohn, Department of Zoology, University of Washington, Seattle, WA 98195, personal communication; see also McHardy 1966). For Hoyer's medium, dissolve 30 g of gum arabic by heating in 50 mL of water. Add 200 g of chloralhydrate and then 16 mL of glycerin (P. A. Jumars, Department of Oceanography, University of Washington, Seattle, WA 98195, personal communication). Light (1978a) employed Turtox CMC-10 Mounting Medium for polychaetes. Both PVA and CMC-10 contract when hardened so preparations, especially thick ones, have to be watched carefully for many weeks. Usually, more embedding medium needs to be added with time before the coverslip can be ringed.

Truly permanent mounts are made in media like Euparal. With mounts in Canada Balsam, details of setae may be poorly visible because of its high refractive index, although phase contrast may ameliorate the problem. Any microscopical technique book may be consulted for the method. With any untried resins, it is advisable to check whether the details of setae show as well, as in e.g., water or glycerin.

For an ongoing program as well as for later checking, a reference collection of local material (specimens as well as preparations) should be maintained at the site of the work and, as a safeguard, additional specimens should be deposited in a major museum. The depository should be mentioned in any publication resulting from the identification effort.

Use of Keys

The sedentariate families are arranged largely as in Hartman (1959), without recognizing higher taxa. The papers by Dales (1977), Fauchald (1977), Mileikowski (1977), and Clark (1978) represent recent attempts, or discussions thereof, to distribute these families over a number of orders that reflect phylogenetic relationships. Similarly adhering to Hartman (1959), we have retained the archiannelid families as a group; Clark (1978) as well as Westheide (1971) and Mileikowski (1977) may be consulted for a discussion of views on their position. Generally, we followed Hartman (1959; 1965a) also in the nomenclature of the taxa; as in Banse and Hobson (1974), however, we treated many genera of other current authors as subgenera, thereby often reverting to the earlier usage of large genera. This approach was taken solely to facilitate use of the key by the nonspecialist for whom identification of polychaetes may be a necessity. The subgeneric names are incorporated in the checklist, keys, and index and permit easy access to other systems.

The principal diagnostic characters of all sedentariate and archiannelid families are summarized in Table 1–6. The figures as well as the text should be consulted (cf. p. 13). Dichotomous keys were given by Berkeley and Berkeley (1952), Ushakov (1955), and Fauchald (1977).

The species keys of each family are preceded by keys to the genera reported from the continental shelves of the cold–temperate North Pacific Ocean as defined on p. 1. Genera and species not known from British Columbia and Washington are marked by (†) unless we have reason to expect their occurrence. The latter taxa, marked with (*), have been recorded off Oregon, or both to the south of Washington and north of British Columbia (or at higher latitudes of the cold–temperate Northwest Pacific). If a specimen cannot be assigned to a genus, the worldwide key by Fauchald (1977) should be consulted.

The diagnostic characters to identify the known species of British Columbia and Washington are presented in the specific keys in a series of alternative choices. Many couplets include additional statements that are not contrasted with each other. The purpose is to preclude species known from elsewhere in the cold–temperate Pacific Ocean, but found for the first time off British Columbia or Washington, from fitting the key accidentally. If a specimen does not match the characterization of a species completely, it is mandatory to consult the appropriate references cited in the keys.

The authors of monographic treatments are listed below the family names. References are usually not supplied below the species name if the species was recorded in Berkeley and Berkeley (1952), *Canadian Pacific Fauna* (CPF, herein). If, however, the Berkeleys' description is inadequate, or the species is misidentified, one or more citations are provided. If only one reference is given, it contains both the description and the record. If two or more are cited, the semicolon separates that (or those) supplying the description from the following one that establishes the record.

All lateral bodily views (or partial views) are presented from the left side. The drawings are not to scale even within species. Numbers in figures denote segments.

An explanation of the abbreviations used in the tables and figures (p. 120) and a glossary of the basic terminology (p. 121) follow the keys.

Finally a cautionary note on using the species keys outside the area for which they have been written is appropriate. We advise against this but are resigned to the fact that it is going to happen because of the absence of other works. It was shown above that our keys are not fully representative of the southern part of the Oregon Province. Further, recall that the phrasing in the specific couplets took into account the diagnostic characters of all species known from the continental shelves between the coast of central Japan and the southern border of the Oregon Province at Point Conception. The supposition was that these species are more likely to be among the hitherto overlooked species than, e.g., Arctic forms. Had we anticipated that the polychaete faunae of the northern part of San Diego province and of British Columbia and Washington showed the same degree of similarity as the faunae of the latter region and the cold–temperate Northwest Pacific Ocean, we would have extended the principle that underlies the phrasing of couplets and taken the polychaetes of the San Diego Province into consideration as well. Thus, in case the keys are used in the southern part of the Oregon Province, the Atlas by Hartman (1968; 1969) must be consulted to reduce the possibility of misidentification. Since the temptation to apply our keys will be greatest in the little-studied Aleutian Province, workers there should be advised that we anticipate the occurrence of undescribed endemic species as well as Arctic forms. The Arctic elements were considered in the phrasing of the couplets only to the extent that they were reported from the Bering and Okhotsk Seas; many Arctic polychaete species do occur there, in contrast to the Gulf of Alaska (Ushakov 1955). Among the mollusks, however, endemics make up about one-quarter of the Aleutian fauna (Valentine 1966) which might be true for the polychaetes as well.

Checklist of Sedentariate and Archiannelid Polychaetes from the Continental Shelves of British Columbia and Washington

Names in boldface indicate that the authors have seen specimens from British Columbia or Washington. A query indicates doubtful records. Species described but not named are also included but forms identified only to genus are omitted.

ORBINIIDAE

Leitoscoloplos panamensis (Monroe)
Leitoscoloplos pugettensis (Pettibone)
Naineris dendritica (Kinberg)
Naineris quadricuspida (Fabricius)
Naineris uncinata Hartman
Orbinia (Phylo) felix (Kinberg)
Orbiniella nuda Hobson
Protoariciella oligobranchia Hobson
Scoloplos acmeceps Chamberlin
Scoloplos armiger (Müller)

QUESTIDAE

Questa caudicirra Hartman

PARAONIDAE

Aricidea assimilis Tebble
Aricidea lopezi Berkeley and Berkeley
Aricidea minuta Southward
Aricidea neosuecica Hartman
Aricidea quadrilobata Webster and Benedict
Aricidea ramosa Annenkova
Cirrophorus branchiatus Ehlers
Cirrophorus lyra (Southern)
Paraonella platybranchia (Hartman)
Paraonella spinifera (Hobson)
Tauberia gracilis (Tauber)

APISTOBRANCHIDAE

Apistobranchus ornatus Hartman
Apistobranchus tullbergi (Théel)?

SPIONIDAE

Laonice cirrata (Sars)?
Laonice pugettensis Banse and Hobson
Malacoceros (Malacoceros) fuliginosus (Claparède)
M. (Rhynchospio) glutaeus (Ehlers)
Paraprionospio pinnata (Ehlers)
Polydora (Boccardia) columbiana Berkeley
P. (Boccardia) hamata Webster
P. (Boccardia) pugettensis Blake
P. (Boccardia) polybranchia Haswell
P. (Boccardia) proboscidea Hartman
P. (Polydora) alloporis Light
P. (Polydora) brachycephala Hartman
P. (Polydora) cardalia Berkeley
P. (Polydora) commensalis Andrews
P. (Polydora) giardi Mesnil
P. (Polydora) ligni Webster
P. (Polydora) pygidialis Blake and Woodwick
P. (Polydora) quadrilobata Jacobi
P. (Polydora) socialis (Schmarda)
P. (Polydora) spongicola Berkeley and Berkeley
P. (Pseudopolydora) kempi japonica Imajima and Hartman
Prionospio cirrifera Wirén
Prionospio steenstrupi Malmgren
Pygospio elegans Claparède
Scolelepis foliosa (Audouin and Milne-Edwards)
Scolelepis squamata (Müller)
Spio (Spio) butleri Berkeley and Berkeley
S. (Spio) cirrifera (Banse and Hobson)
S. (Spio) filicornis (Müller)
Spiophanes berkeleyorum Pettibone
Spiophanes bombyx (Claparède)
Spiophanes kroyeri Grube
Streblospio benedicti Webster

TROCHOCHAETIDAE

Trochochaeta multisetosa (Oersted)

MAGELONIDAE

Magelona berkeleyi Jones
Magelona hobsonae Jones
Magelona longicornis Johnson
Magelona sacculata Hartman

CHAETOPTERIDAE

Chaetopterus variopedatus (Renier)
Mesochaetopterus taylori Potts
Phyllochaetopterus claparedii McIntosh
Phyllochaetopterus prolifica Potts
Spiochaetopterus costarum (Claparède)

CIRRATULIDAE

Caulleriella alata (Southern)?
Chaetozone acuta Banse and Hobson
Chaetozone setosa Malmgren
Chaetozone spinosa Moore?
Cirratulus cirratus (Müller)
Cirratulus spectabilis (Kinberg)
Dodecaceria concharum Oersted
Dodecaceria fewkesi Berkeley and Berkeley
Tharyx multifilis Moore
Tharyx parvus Berkeley
Tharyx secundus Banse and Hobson
Tharyx serratisetis Banse and Hobson

ACROCIRRIDAE

Acrocirrus columbianus Banse
Acrocirrus occipitalis Banse
Macrochaeta pege Banse

COSSURIDAE

Cossura soyeri Laubier
Cossura sp.

CTENODRILIDAE

Ctenodrilus serratus (Schmidt)

FLABELLIGERIDAE

Brada sachalina Annenkova
Brada villosa (Rathke)
Flabelligera affinis Sars
Pherusa negligens (Berkeley and Berkeley)
Pherusa plumosa (Müller)
Piromis eruca (Claparède)

SCALIBREGMIDAE

Asclerocheilus beringianus Ushakov
Hyboscolex pacificus (Moore)
Scalibregma inflatum Rathke

OPHELIIDAE

Armandia brevis (Moore)
Euzonus mucronata (Treadwell)
Euzonus williamsi (Hartman)
Ophelia limacina (Rathke)
Ophelina acuminata Oersted
Ophelina breviata (Ehlers)
Travisia brevis Moore
Travisia forbesii Johnston
Travisia japonica Fujiwara
Travisia pupa Moore

STERNASPIDAE

Sternaspis scutata (Renier)

CAPITELLIDAE

Barantolla americana Hartman
Capitella capitata (Fabricius)
Capitella dizonata Johnson
Decamastus gracilis Hartman
Heteromastus filiformis (Claparède)
Heteromastus filobranchus Berkeley and Berkeley
Mediomastus ambiseta (Hartman)
Mediomastus capensis Day
Notomastus giganteus Moore
Notomastus lineatus Claparède
Notomastus tenuis Moore
Notomastus variegatus Berkeley and Berkeley

PARERGODRILIDAE

Stygocapitella subterranea Knöllner

ARENICOLIDAE

Abarenicola claparedi oceanica Healy and Wells
Abarenicola claparedi vagabunda Healy and Wells
Abarenicola pacifica Healy and Wells
Arenicola marina (Linnaeus)
Branchiomaldane vincenti Langerhans

MALDANIDAE

Asychis biceps (Sars)
Asychis disparidenta (Moore)
Asychis lacera (Moore)
Asychis similis (Moore)
Axiothella rubrocincta (Johnson)
Clymenella torquata (Leidy)
Clymenura columbiana (Berkeley)
Euclymene zonalis (Verrill)
Euclymene cf. zonalis (Verrill)
Isocirrus longiceps (Moore)
Macroclymene sp.
Maldane glebifex Grube
Maldane sarsi sarsi Malmgren
Maldanella harai (Izuka)
Maldanella robusta Moore
Micromaldane ornithochaeta Mesnil
Nicomache lumbricalis (Fabricius)
Nicomache personata Johnson
Notoproctus pacificus (Moore)
Petaloproctus tenuis borealis Arwidsson
Petaloproctus tenuis tenuis (Théel)
Praxillella affinis affinis (Sars)
Praxillella affinis pacifica Berkeley
Praxillella gracilis (Sars)
Praxillella praetermissa (Malmgren)
Praxillura maculata Moore
Rhodine bitorquata Moore

OWENIIDAE

Myriochele oculata Zachs
Owenia fusiformis *delle* Chiaje

SABELLARIIDAE

Idanthyrsus armatus Kinberg
Idanthyrsus ornamentatus (Chamberlin)
Sabellaria cementarium Moore

AMPHICTENIDAE

Pectinaria (Amphictene) moorei Annenkova
P. (Cistenides) granulata (Linnaeus)
P. (Pectinaria) californiensis Hartman

AMPHARETIDAE

Amage anops (Johnson)
Ampharete acutifrons (Grube)
Ampharete finmarchica (Sars)
Ampharete goesi brazhnikovi Annenkova
Ampharete goesi goesi Malmgren
Ampharete labrops Hartman
Amphicteis mucronata Moore
Amphicteis scaphobranchiata Moore
Amphisamytha bioculata (Moore)
Anobothrus gracilis (Malmgren)
Asabellides lineata (Berkeley and Berkeley)
Asabellides sibirica (Wirén)
Hobsonia florida (Hartman)
Lysippe labiata Malmgren
Melinna cristata (Sars)
Melinna elisabethae McIntosh
Samytha californiensis Hartman
Schistocomus hiltoni Chamberlin
Sosanopsis hesslei Banse

TEREBELLIDAE

Amaeana occidentalis (Hartman)
Amphitrite cirrata Müller
Artacama conifera Moore
Betapista dekkerae Banse
Eupolymnia heterobranchia (Johnson)
Lanassa venusta venusta (Malm)
Laphania boecki Malmgren
Lysilla loveni Malmgren
Neoamphitrite edwardsi (Quatrefages)
Neoamphitrite robusta (Johnson)
Neoleprea japonica Hessle
Neoleprea spiralis (Johnson)
Nicolea zostericola (Oersted)
Pista brevibranchiata Moore
Pista cristata (Müller)
Pista elongata Moore
Pista moorei Berkeley and Berkeley
Pista pacifica Berkeley and Berkeley
Polycirrus californicus Moore
Polycirrus sp. I
Polycirrus sp. II
Polycirrus sp. III
Polycirrus sp. IV
Polycirrus sp. V
Proclea graffii (Langerhans)
Scionella estevanica Berkeley and Berkeley
Scionella japonica Moore
Streblosoma bairdi (Malmgren)
Terebella ehrenbergi Grube
Thelepus cincinnatus (Fabricius)
Thelepus crispus Johnson
Thelepus japonicus Marenzeller?
Thelepus setosus (Quatrefages)

TRICHOBRANCHIDAE

Novobranchus pacificus Berkeley and Berkeley
Terebellides stroemi Sars
Trichobranchus glacialis Malmgren

SABELLIDAE

Chone aurantiaca (Johnson)
Chone duneri Malmgren
Chone ecaudata (Moore)
Chone infundibuliformis Kröyer
Chone magna (Moore)
Euchone analis (Kröyer)
Euchone incolor Hartman
Eudistylia catharinae Banse
Eudistylia polymorpha (Johnson)
Eudistylia vancouveri (Kinberg)
Fabricia oregonica Banse
Fabricia sabella (Ehrenberg)
Fabriciola berkeleyi Banse
Jasmineira pacifica Annenkova
Laonome kroyeri Malmgren
Manayunkia aestuarina (Bourne)
Megalomma splendida (Moore)
Myxicola aesthetica (Claparède)
Myxicola infundibulum (Renier)
Oriopsis gracilis Hartman
Oriopsis minuta (Berkeley and Berkeley)
Potamilla neglecta (Sars)
Potamilla intermedia Moore
Potamilla myriops Marenzeller
Potamilla occelata Moore
Sabella (Demonax) media (Bush)
S. (Demonax) pacifica (Berkeley and Berkeley)
S. (Sabella) crassicornis Sars
Sabellastarte sp.
Schizobranchia insignis Bush

SERPULIDAE

Apomatus geniculatus (Moore and Bush)
Apomatus timmsii Pixell
Crucigera irregularis Bush
Crucigera zygophora (Johnson)
Protula pacifica Pixell
Pseudochitinopoma occidentalis (Bush)
Salmacina tribranchiata (Moore)
Serpula vermicularis Linnaeus
Spirorbis (Circeis) spirillum (Linnaeus)
S. (Eulaeospira) variabilis Bush
S. (Janua) pusilloides Bush
S. (Leodora) validus Verrill
S. (Paradexiospira) nakamurai (Uchida)
S. (Prodexiospira) violaceus Levinsen
S. (Pileolaria) granulatus (Linnaeus)
S. (Pileolaria) langerhansi (Caullery and Mesnil)
S. (Pileolaria) moerchi Levinsen
S. (Protolaeospira) ambilateralis Pixell
S. (Protolaeospira) racemosus (Pixell)
S. (Romanchella) medius Pixell
S. (Spirorbis) borealis Daudin

PROTODRILIDAE

Protodriloides chaetifer (Remane)
Protodrilus flabelliger Wieser

SACCOCIRRIDAE

Saccocirrus eroticus Gray

DINOPHILIDAE

Dinophilus kincaidi Jones and Ferguson
Diurodrilus ankeli Ax
Trilobodrilus nipponicus Uchida and Okuda

NERILLIDAE

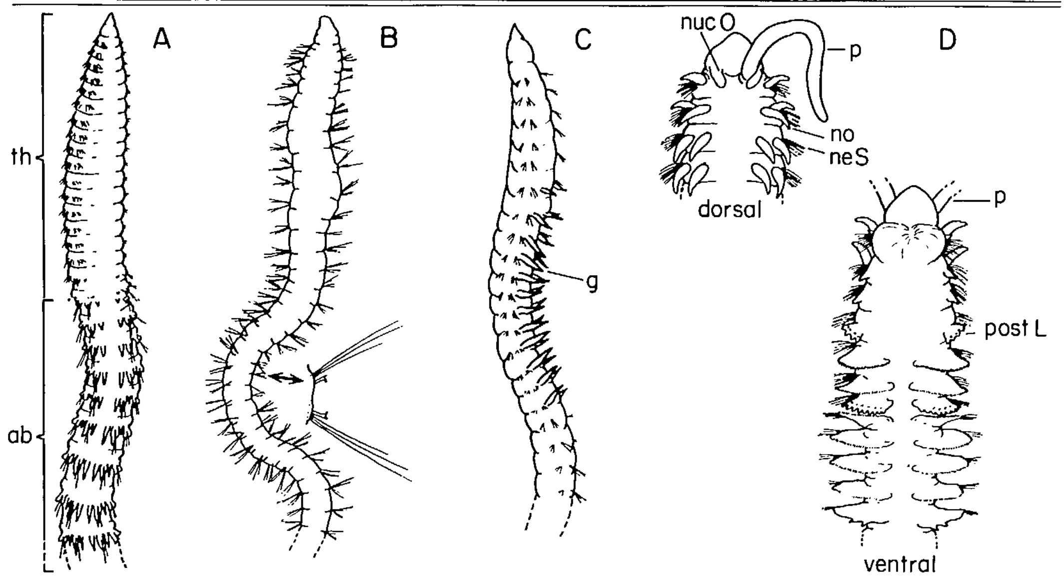
Nerilla antennata Schmidt
Nerilla digitata Wieser
Nerilla inopinata Gray

Principal External Diagnostic Characters of Families of Sedentariate and Archiannelid Polychaetes

Polychaetes usually are easily identified to the family level on the basis of their external appearance. For this purpose, the following tables provide an illustration and a summary of some external diagnostic characters of each family of sedentariate and archiannelid polychaetes. The tabular information for each family extends horizontally across both facing pages. The user should not attempt to classify specimens solely on the basis of the figures; the tabular material also must be utilized so that families with similar appearances are not confused.

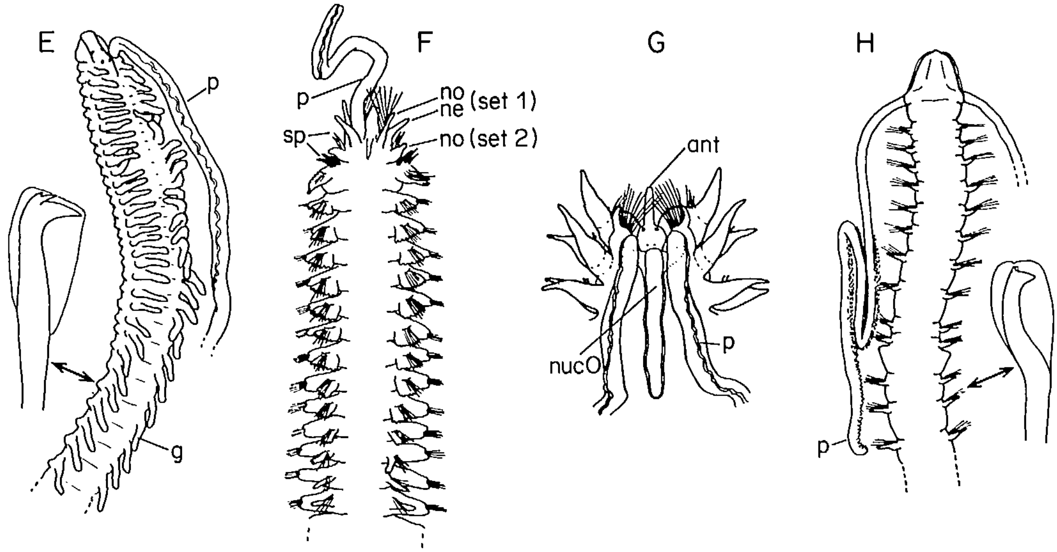
Although some of the figures are original, the majority have been drawn from Banse (1969), Berkeley and Berkeley (1952), Day (1967), Hartman (1945, 1947, 1961, 1965b, 1966, 1969), Jones (1974), Jouin (1971), Karling (1958), Levenstein (1970), Pettibone (1963a), Potts (1914), Swedmark (1964), Ushakov (1955), Wilfert (1973), and Wu and Yang (1962). Most figures have been simplified or modified for similarity of style.

TABLE 1, FIG. A–H.



Family	Appendages of anterior end	Setae
ORBINIIDAE Table 1, fig. A Page 26; Fig. 1	absent	notosetae spl neurosetae spl
QUESTIDAE Table 1, fig. B Page 29; Fig. 2	absent	notosetae spl neurosetae spl
PARAONIDAE Table 1, fig. C Page 30; Fig. 3	0–1 ant	notosetae spl neurosetae spl
APISTOBRANCHIDAE Table 1, fig. D Page 34	1 pair grooved palps [often lost]	notosetae absent neurosetae spl
SPIONIDAE Table 1, fig. E Page 34; Fig. 4–6	1 pair grooved palps [often lost]	notosetae spl neurosetae spl
TROCHOCHAETIDAE Table 1, fig. F Page 45	0–1 occipital ant [small] 1 pair grooved palps [often lost]	notosetae spl [absent in median region] neurosetae spl
POECILOCHAETIDAE† Table 1, fig. G Page 46	1 anterior ant 1 pair grooved palps [often lost] 3-lobed nuchal organ [absent in *Elicodasia*†]	notosetae spl neurosetae spl
MAGELONIDAE Table 1, fig. H Page 46; Fig. 7	1 pair papillated palps	notosetae spl neurosetae spl

TABLE 1, FIG. A–H *(cont.)*



Other diagnostic characters

Parapodia lateral in thorax, dorsal in abdomen (as in Table 1, fig. A)
Abdomen usually appearing "ragged"
Without jaws

Resembling oligochaete [however, gonads in several segments]
With few bidentate hooks (as in Table 1, fig. B, insert)

Several anterior segments with simple gills (as in Table 1, fig. C)

Notopodia cirruslike, with aciculae
Some anterior neuropodia with fimbriated postsetal lobes (as in Table 1, fig. D)
Without jaws

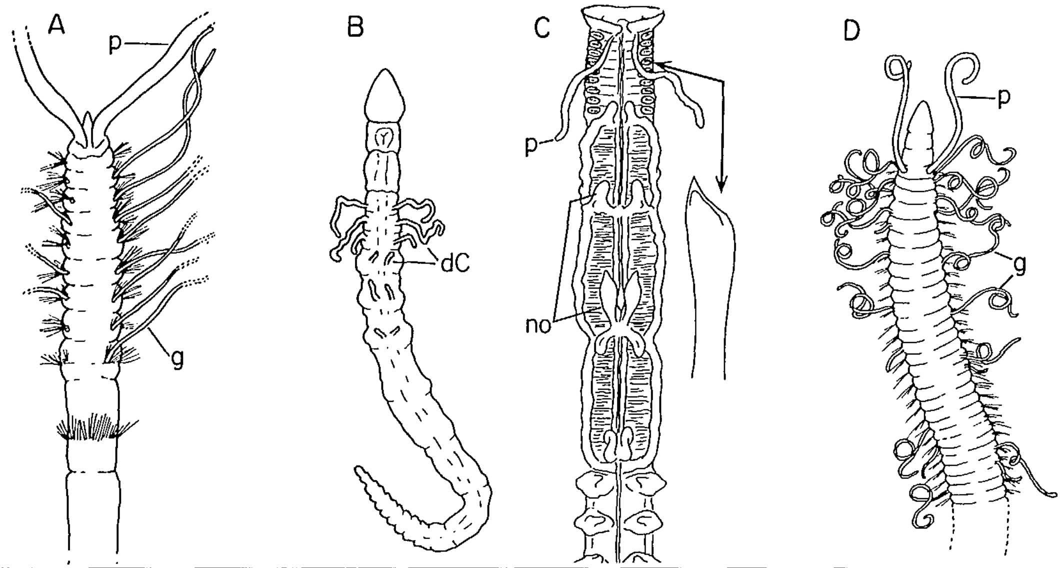
Few anterior to many segments with [usually] spl (as in Table 1, fig. E) or pinnate gills
With hooded hooks [without hoods in some *Spiophanes* spp.] at least in posterior neuropodia (as in Table 1, fig. E, insert)

Noto- and neurocirri spindle- or bottle-shaped
Setiger 1 with setae directed anteriorly; setiger 3, and sometimes 2, with neuropodial spines (as in Table 1, fig. F)

Setiger 1 with setae directed anteriorly [not *Elicodasia*†] (as in Table 1, fig. G)
Neuropodial spines on few anterior or most setigers

Setigers 1–8 with capillary setae; setiger 9 with capillary or spatulate setae; remaining setigers with hooded hooks (as in Table 1, fig. H, insert)

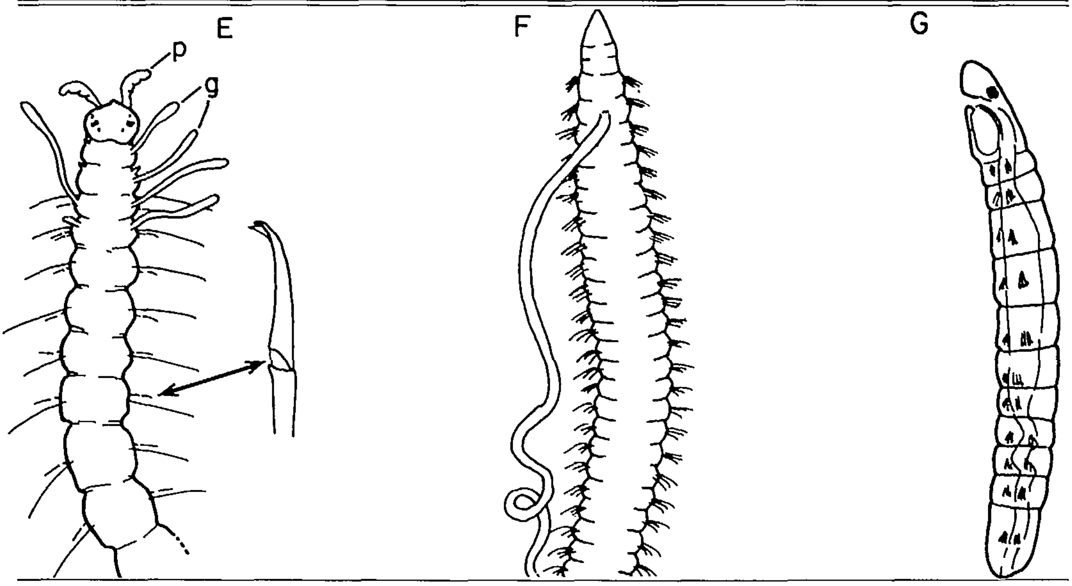
TABLE 2, FIG. A–G.



Family	Appendages of anterior end	Setae
HETEROSPIONIDAE† Table 2, fig. A Page 48	1 pair grooved palps [often lost]	notosetae spl neurosetae spl
PSAMMODRILIDAE[1] Table 2, fig. B	absent	notosetae absent neurosetae absent ant'ly, spl post'ly
CHAETOPTERIDAE Table 2, fig. C Page 48; Fig. 8	0 or 2 ant 1 pair grooved palps [often lost]	notosetae absent ant'ly, spl post'ly neurosetae spl
CIRRATULIDAE Table 2, fig. D Page 50, Fig. 9	1 pair or several grooved palps in 1 or more paired patches [except *Raricirrus*†] [often lost]	notosetae spl neurosetae spl
ACROCIRRIDAE Table 2, fig. E Page 54; Fig. 10	0 or 1 pair grooved palps [often lost]	notosetae spl neurosetae cpd
COSSURIDAE Table 2, fig. F Page 55	absent	notosetae spl neurosetae spl
CTENODRILIDAE Table 2, fig. G Page 55	absent	notosetae spl neurosetae spl

[1]The Psammodrilidae are not known from the cold–temperate North Pacific. Reference: SWEDMARK (1958).

Table 2, fig. A–G *(cont.)*



Other diagnostic characters

Setigers 2–9 with threadlike gills; remaining setigers greatly elongate, almost encircled by setae (as in Table 2, fig. A)

With dorsal cirri on 6 anterior segments (as in Table 2, fig. B)

Body with 2 or 3 distinct regions
Setiger 4 with large modified setae (as in Table 2, fig. C, insert)

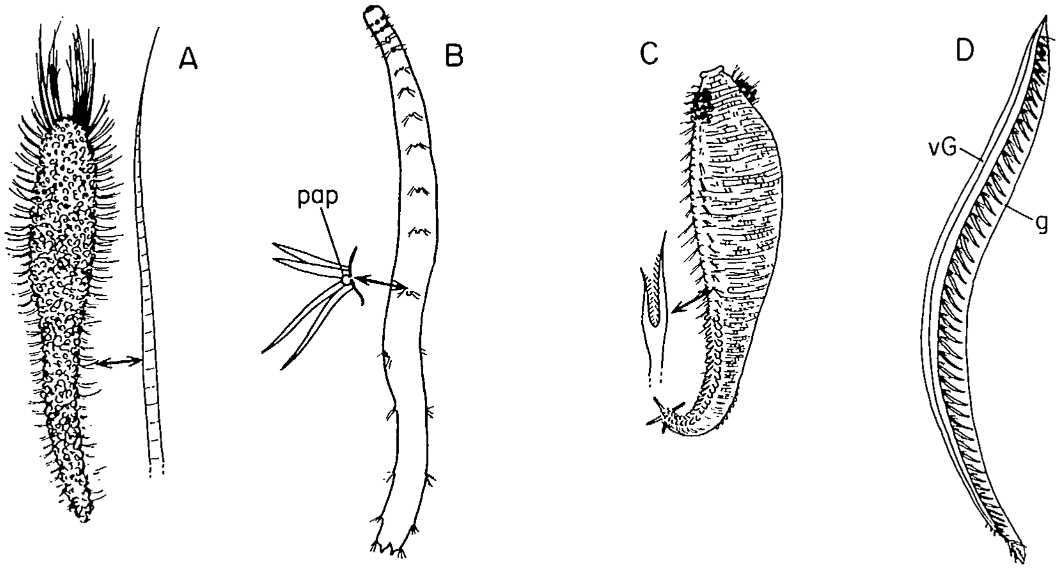
Anterior setigers usually narrow [crowded]
Few to many segments with long threadlike gills (as in Table 2, fig. D)

Anterior segments with 0 or 4 pairs [usually] of gills (as in Table 2, fig. E) [often lost]
Notosetae transversely barred, finely spinose; neurosetae compound (as in Table 2, fig. E, insert)

Numerous segments
Setiger 2 or 3 with long median tentacle (as in Table 2, fig. F)

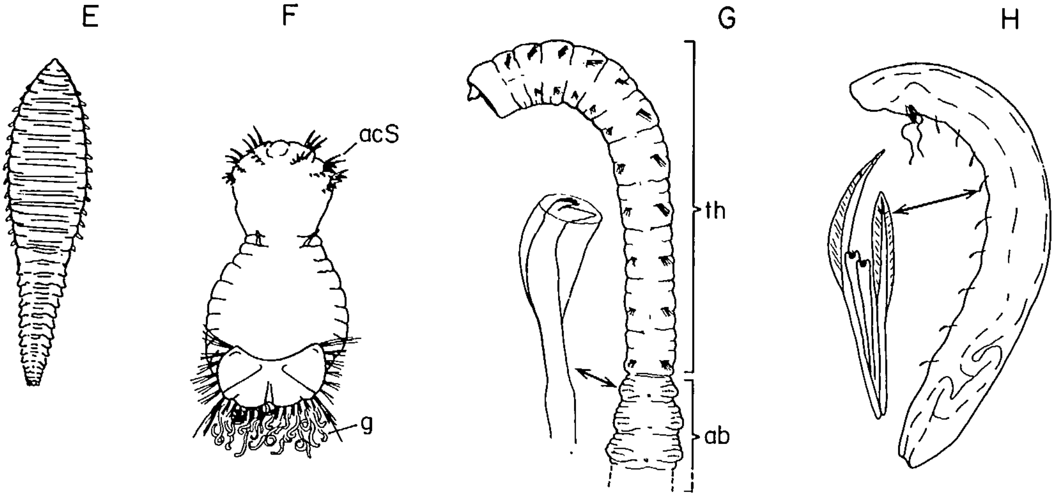
Raphidrilus† with 0–2 median unpaired cirri on anterior segments
Juveniles of *Raphidrilus*† with segmental gills

TABLE 3, FIG. A–H.



Family	Appendages of anterior end	Setae
FLABELLIGERIDAE Table 3, fig. A Page 56, Fig. 11	1 pair grooved palps [retractile] Few to many threadlike gills [retractile]	notosetae spl neurosetae spl, pscp, or cpd
FAUVELIOPSIDAE[2] Table 3, fig. B	absent	notosetae spl neurosetae spl
SCALIBREGMIDAE Table 3, fig. C Page 59; Fig. 12	0 or 2 ant [short projections]	notosetae spl neurosetae spl [cpd in *Scalispinigera*†]
OPHELIIDAE Table 3, fig. D, E Page 60; Fig. 13	absent	notosetae spl neurosetae spl
STERNASPIDAE Table 3; fig. F Page 63	absent	setae spl
CAPITELLIDAE Table 3, fig. G Page 63; Fig. 14	absent	notosetae spl neurosetae spl
PARERGODRILIDAE Table 3, fig. H Page 67	absent	setae spl [1 bundle per parapodium]

[2]The Fauveliopsidae are not known from the continental shelf in the cold–temperate North Pacific. References: FAUCHALD (1977), KATZMANN AND LAUBIER (1974).



Other diagnostic characters

Body surface covered with papillae and sediment (as in Table 3, fig. A) or with mucus
With (as in Table 3, fig. A) or without cephalic cage of setae
Notosetae, and often neurosetae, transversely barred, smooth (as in Table 3, fig. A, insert)

Body surface smooth (as in Table 3, fig. B) or with few small papillae; without ventral groove
Acicular setae (as in Table 3, fig. B, insert) sometimes accompanied by capillary setae

Body often anteriorly swollen (as in Table 3, fig. C); segments often secondarily annulated
Parapodia usually with some short forked setae (as in Table 3, fig. C, insert)

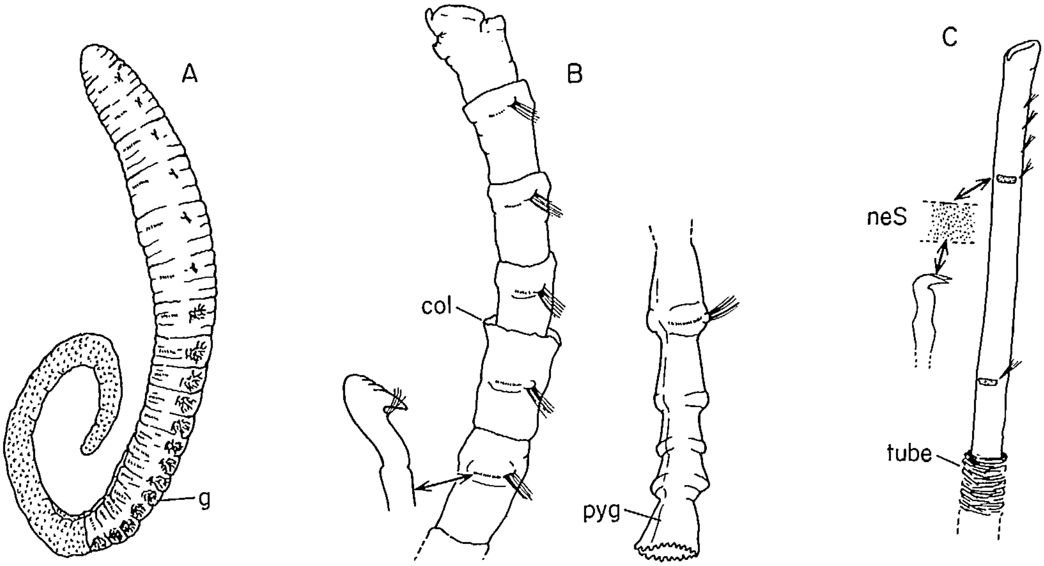
Body often grooved ventrally (as in Table 3, fig. D)
All setae capillaries, sometimes with dentate margins

Anterior end with acicular setae (as in Table 3, fig. F); posterior end with horny ventral plate and numerous threadlike gills

At least first 4 setigers with capillaries only; sometimes followed by setigers with dorsal capillaries and ventral hooded hooks; abdominal [except in some *Mediomastus* spp.] and sometimes posterior thoracic setigers with hooded hooks only (as in Table 3, fig. G, insert)

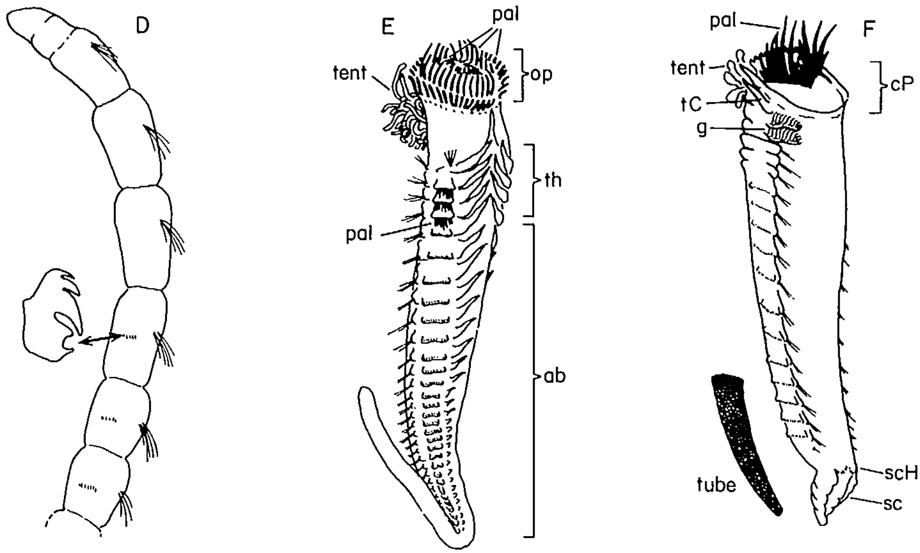
Body small, with 8–11 setigers
Parapodia with few limbate and forked setae (as in Table 3, fig. H, insert)

Table 4, fig. A–F.



Family	Appendages of anterior end	Setae
ARENICOLIDAE Table 4, fig. A Page 67; Fig. 15	absent	notosetae spl neurosetae spl
MALDANIDAE Table 4, fig. B Page 68; Fig. 16, 17	absent	notosetae spl neurosetae spl
OWENIIDAE Table 4, fig. C Page 77; Fig. 18	0–1 pair grooved palps With or without membranous funnel	notosetae spl neurosetae spl
BOGUEIDAE[3] Table 4, fig. D	absent	notosetae spl neurosetae spl
SABELLARIIDAE Table 4, fig. E Page 78; Fig. 19	1 pair palps, 0–several cirriform lobes } [rarely seen] many filiform oral tentacles [except *Phalacrostemma*†]	notosetae spl
AMPHICTENIDAE Table 4, fig. F Page 79; Fig. 20	2 pair tC many filiform oral tentacles	notosetae spl neurosetae spl

[3]The Bogueidae are not known from the cold–temperate North Pacific. Reference: Hartman and Fauchald (1971).



Other diagnostic characters

Segments secondarily annulated; many median segments with [usually] branched gills (as in Table 4, fig. A)
All notosetae capillaries; all neurosetae unhooded hooks

Most setigers longer than wide (as in Table 4, fig. B). All notosetae capillaries; all neurosetae unhooded hooks with tuft below main tooth (as in Table 4, fig. B, insert) [sometimes instead spines in few anterior setigers]

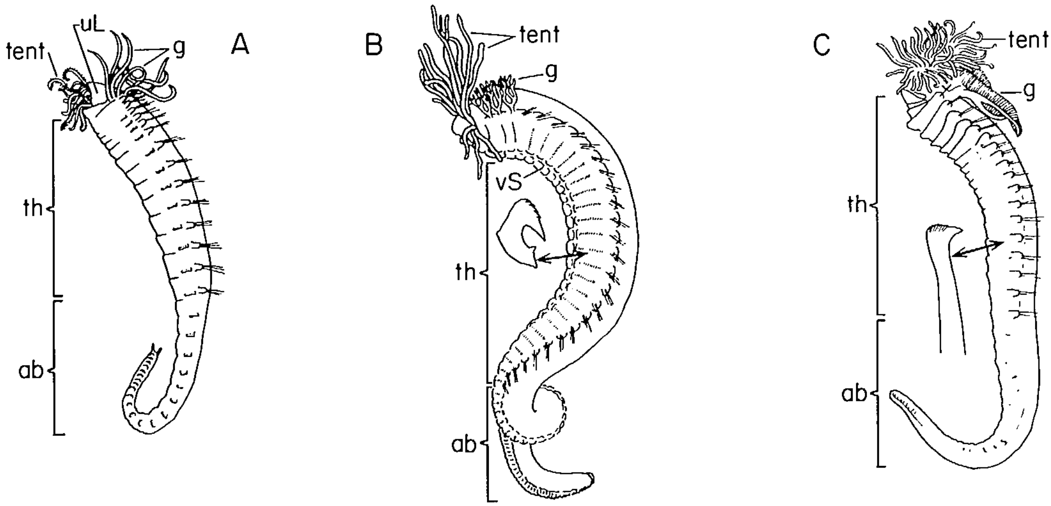
Setigers 1–3 often much shorter than following setigers (as in Table 4, fig. C), without neurosetae
All notosetae capillaries; all neurosetae small, unhooded bi- or tridentate hooks in several rows (as in Table 4, fig. C, insert)

Body form similar to that of Oweniidae (as in Table 4, fig. C)
Neurosetae avicular uncini (as in Table 4, fig. D, insert) in 1 or 2 rows

Anterior end with 2 or 3 concentric rows of paleae with metallic sheen (as in Table 4, fig. E)
With notopodial paleae on 3 or 4 thoracic segments

Anterior end with 2 fascicles of paleae with metallic sheen (as in Table 4, fig. F)
Tube sandy, conical (as in Table 4, fig. F [scale reduced])
All notosetae capillaries; all neurosetae pectinate or [sometimes] avicular uncini (as in Table 4, fig. D, insert; Fig. 20b)

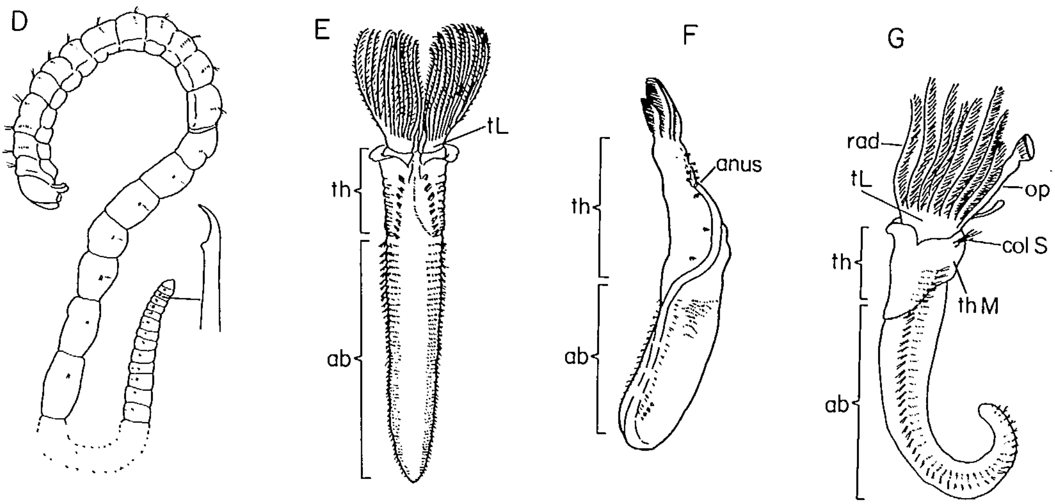
TABLE 5, FIG. A–G.



Family	Appendages of anterior end	Setae
AMPHARETIDAE Table 5, fig. A Page 80; Fig. 21	few to many retractile tentacles [appear to emerge from mouth if everted]	notosetae spl ant'ly absent post'ly neurosetae spl
TEREBELLIDAE Table 5, fig. B Page 86; Fig. 22, 23	few to many nonretractile tentacles [appear to insert above mouth]	notosetae spl ant'ly usually absent post'ly neurosetae spl
TRICHOBRANCHIDAE Table 5, fig. C Page 96; Fig. 24	few to many nonretractile tentacles [appear to insert above mouth]	notosetae spl ant'ly usually absent post'ly neurosetae spl
SABELLONGIDAE[4] Table 5, fig. D	1 pair palps	notosetae spl neurosetae spl
SABELLIDAE Table 5, fig. E Page 97; Fig. 25, 26	crown of "gills" [tentacular lobes, stiff and pinnate; often lost]	notosetae spl neurosetae spl
CAOBANGIIDAE[5] Table 5, fig. F	crown of pinnate "gills"	notosetae spl neurosetae spl
SERPULIDAE Table 5, fig. G Page 107; Fig. 27, 28	crown of pinnate "gills" [as in Sabellidae]	notosetae spl neurosetae spl

[4]The Sabellongidae are not known from the cold–temperate North Pacific. Reference: HARTMAN (1969).

[5]The Caobangiidae are not known from the cold–temperate North Pacific. Reference: JONES (1974).



Other diagnostic characters

Anterior end with (as in Fig. 21c) or without paleae (as in Table 5, fig. A)
With 3–4, rarely 2, pairs of usually simple gills (as in Table 5, Fig. A [lost gills leave scars])
All notosetae capillaries; all neurosetae avicular uncini (as in Fig. 21a)

With 0–3 pairs of branched [usually] gills (as in Table 5, fig. B)
All notosetae capillaries; all neurosetae avicular uncini (as in Table 5, fig. B, insert)

With 1 single branched (as in Table 5, fig. C) or 2–4 pairs of simple or branched gills
All notosetae capillaries; thoracic neurosetae unhooded acicular uncini (as in Table 5, fig. C, insert) or spines (as in Fig. 24d); abdominal neurosetae avicular uncini (as in Table 5, fig. B, insert)

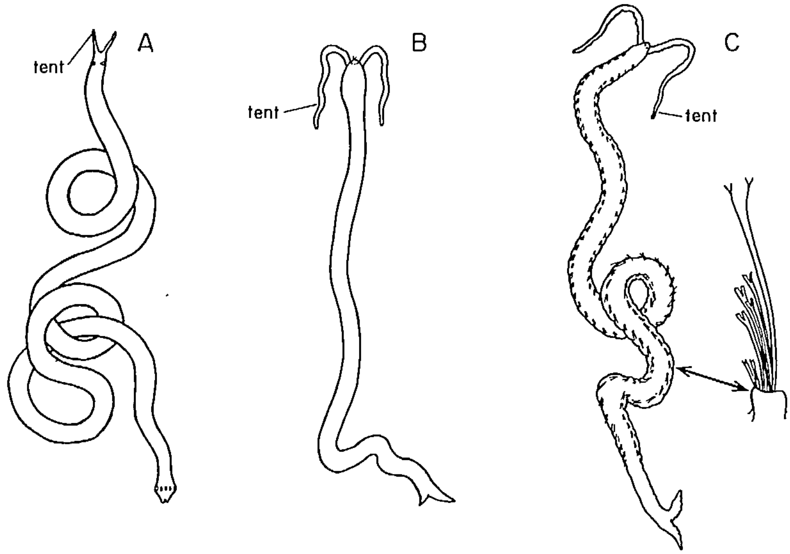
Last few segments with large falcate spines (as in Table 5, fig. D, insert)
Parapodia inverted in abdomen [uncini or hooks neuropodial in thorax, notopodial in abdomen]

Tube, if any, usually membranous
Parapodia inverted in abdomen [uncini neuropodial in thorax, notopodial in abdomen]

Anus near anterior end
Parapodia inverted in abdomen [uncini neuropodial in thorax, notopodial in abdomen]

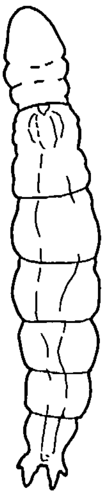
1 [rarely 0 or 2] radiole modified into operculum (as in Table 5, fig. G)
Usually with thoracic membrane (as in Table 5, fig. G)
Tube calcareous
Parapodia inverted in abdomen [uncini neuropodial in thorax, notopodial in abdomen]

TABLE 6, FIG. A–E.



Family	Appendages of anterior end	Setae
POLYGORDIIDAE Table 6, fig. A Page 115	2 tentacles	setae absent [spl in *Chaetogordius*†]
PROTODRILIDAE Table 6, fig. B Page 115; Fig. 29	2 tentacles	setae absent [spl in *Protodriloides chaetifer*]
SACCOCIRRIDAE Table 6, fig. C Page 117; Fig. 29	2 tentacles	notosetae absent neurosetae spl
DINOPHILIDAE Table 6, fig. D Page 117; Fig. 29	absent	setae absent [spl in *Parapodrilus*†]
NERILLIDAE Table 6, fig. E Page 118; Fig. 29	0–3 ant 0–1 pair palps 0 [rarely 1] pair tC	notosetae spl or cpd neurosetae spl or cpd

TABLE 6, FIG. A–E *(cont.)*



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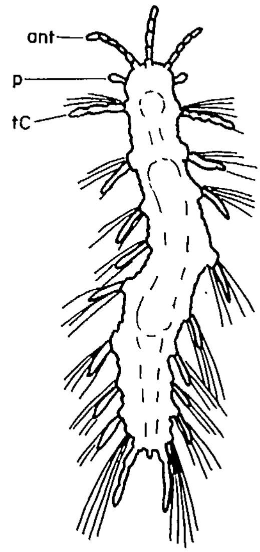


E

Other diagnostic characters

May be long	ARCHIANNELIDA (see Key on page 114)
Usually less than 15 mm long	
Most setae forked (as in Table 6, fig. C, insert)	
Usually less than 1 mm long	
Usually less than 1 mm long	

KEYS

SEDENTARIA

ORBINIIDAE

(ARICIIDAE IN CPF)

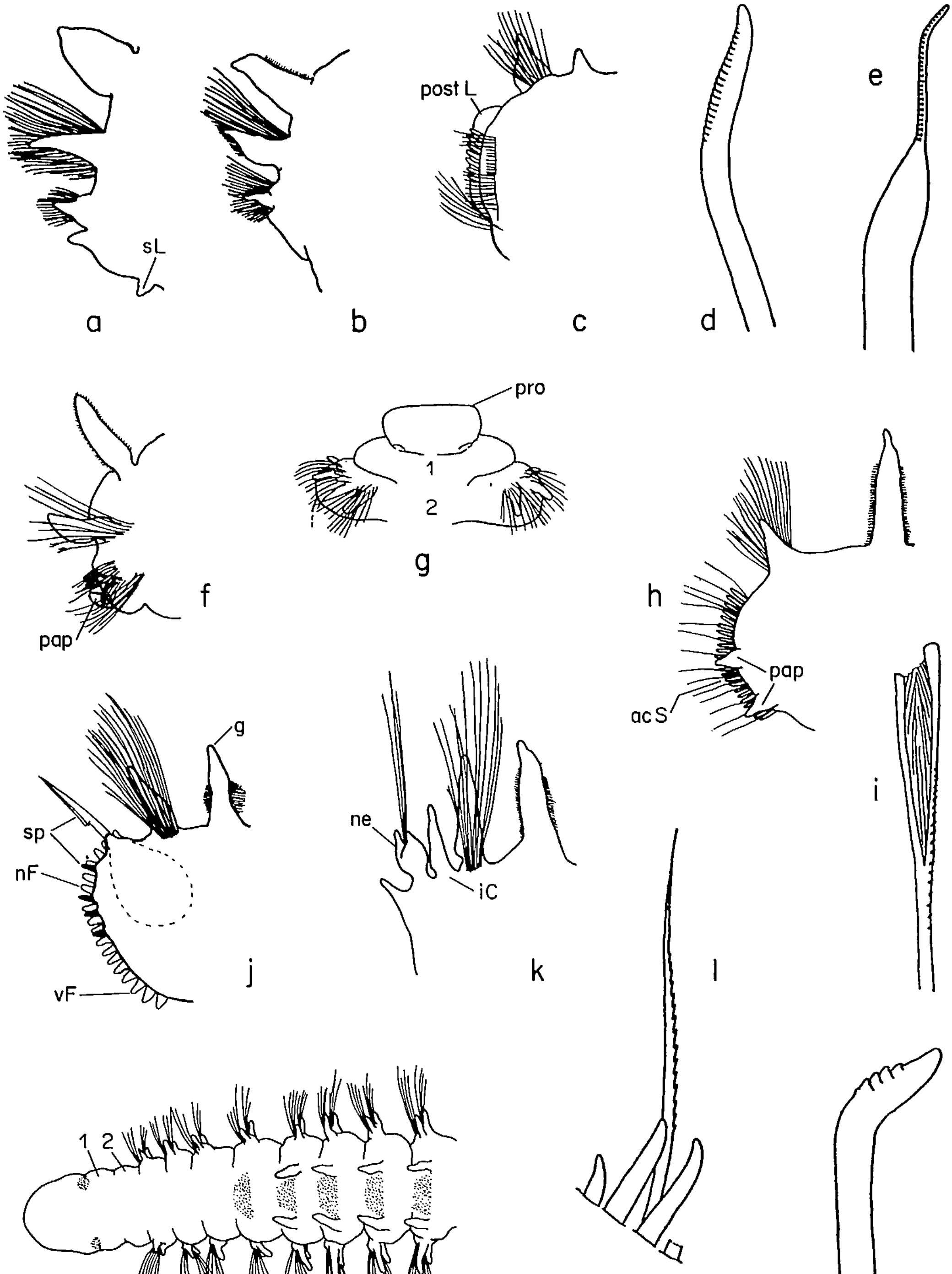
Table 1, fig. A; Fig. 1

DAY (1973); HARTMAN (1957); PETTIBONE (1957)

The abdomen begins where the neuropodia become dorsal in position (as in Fig. 1k). Interramal cirri, slender lobes situated between the noto- and neuropodia, may occur on posterior thoracic and anterior and median abdominal segments (as in Fig. 1k).

1	Segments 1 and 2 without parapodia (as in Fig. 1m). Body usually shorter than 2 cm. PROTOARICIINAE	2
	Segment 1 without parapodia (as in Fig. 1g). Body longer than 2 cm. ORBINIINAE	4
2	Without gills. Neuropodia with both acicular and capillary setae (as in Fig. 1*l*)	*Orbiniella*
	With gills (as in Fig. 1m)	3
3	Abdominal neuropodia with crenulated capillary setae only	*Protoaricia*†
	Abdominal neuropodia with both acicular and crenulated capillary setae	*Protoariciella*
4	Prostomium rounded or truncated (as in Fig. 1g) anteriorly	*Naineris*
	Prostomium pointed anteriorly (as in Table 1, Fig. A). First 3 neuropodia without large brush-tipped setae	5

FIG. 1. ORBINIIDAE: *Leitoscoloplos panamensis*: a, thoracic parapodium 17, posterior view. *L. pugettensis*: b, thoracic parapodium 20, posterior view. *Naineris dendritica*: c, thoracic parapodium 16, anterior view [distal parts of capillary setae in middle part of neuropodium omitted]; d, acicular neuroseta; e, subuluncinus. *N. quadricuspida*: f, thoracic parapodium 11, anterior view. *N. uncinata*: g, anterior end, dorsal view; h, thoracic parapodium, posterior view; i, forked notoseta. *Orbinia felix*: j, thoracic parapodium 15, anterior view [most neuropodial setae omitted]; k, median abdominal parapodium, anterior view. *Orbiniella nuda*: *l*, capillary seta and spines, neuropodium 18, anterior view. *Protoariciella oligobranchia*: m, anterior end, dorsal view. *Scoloplos armiger*: n, acicular neuroseta. Sources: a, b, d, e, i–k, n, Hartman (1957); c, g, original; f, Fauvel (1927); h, Pettibone (1957); *l*, Hobson (1974); m, Hobson (1976) [a, b, d, e, h–k, n, modified].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5 Postsetal lobes on posterior thoracic neuropodia fringed (as in Fig. 1j) .... *Orbinia*

Postsetal lobes on posterior thoracic neuropodia smooth (as in Fig. 1a, b) 6

6 Thoracic neuropodia with acicular setae (as in Fig. 1n) .... *Scoloplos*

The acicular setae may be lacking in juveniles (cf. BROWN 1979) or may be overlooked by being short.

Thoracic neuropodia without acicular setae [examine several parapodia] .... *Leitoscoloplos*

Leitoscoloplos Day

1 With 1 or 2 subpodial lobes on posterior thoracic segments (Fig. 1a) .... *L. panamensis* (Monro)

(See *Haploscoloplos panamensis* in HARTMAN 1969; *Scoloplos panamensis* in HOBSON 1976)

Without subpodial lobes (Fig. 1b) .... *L. pugettensis* (Pettibone)

(*Haploscoloplos elongata* [not Quatrefages] in CPF, see *Scoloplos pugettensis* in PETTIBONE 1957)

Naineris Blainville

In the listed species, some thoracic acicular neurosetae are ridged (as in Fig. 1d), and some abdominal notosetae are forked (as in Fig. 1i). Subuluncini (as in Fig. 1e) are setae intermediate in form between capillary and acicular setae.

1 Prostomium rounded anteriorly. Postsetal lobe of thoracic neuropodia with single papilla (Fig. 1f). Thoracic neuropodia without subuluncini .... *N. quadricuspida* (Fabricius)

(See FAUVEL 1927; HOBSON 1974)

Prostomium truncated anteriorly (as in Fig. 1g). Postsetal lobe of thoracic neuropodia otherwise 2

2 Postsetal lobe of thoracic neuropodia a low ridge, without papillae (Fig. 1c). Thoracic neuropodia with subuluncini (Fig. 1e). Gills from setiger 7–15. (See also Fig. 1d) .... *N. dendritica* (Kinberg)

(*N. laevigata* [not Grube] in CPF)

This taxon may be a subspecies of *N. laevigata* Grube† according to HARTMAN (1957).

Postsetal lobe of thoracic neuropodia with papillae: 1 on setigers 1–6, 2 on remaining thoracic setigers (Fig. 1h). Thoracic neuropodia without subuluncini. Gills from setiger 5 or 6. (See also Fig. 1g, i) .... *N. uncinata* Hartman

(See HARTMAN 1969)

Some specimens from British Columbia may have up to 3–5 papillae on each postsetal lobe of posterior thoracic neuropodia.

N. berkeleyorum PETTIBONE, 1957, is a synonym of this species (HARTMAN 1959).

Orbinia Quatrefages

1 Posterior thoracic neuropodia without spines .... *Subgenus Orbinia*†

Posterior thoracic neuropodia with spines (as in Fig. 1j). Subgenus *Phylo*. Ventral fringe (Fig. 1j) on setigers 11–14 through 17–22 with up to 11–18 papillae. Anterior and median abdominal parapodia with interramal cirri (Fig. 1k) .... *O. felix* (Kinberg)
(*Aricia michaelseni* Ehlers in CPF, see also Banse et al. 1968 [as *Phylo felix*])

Orbiniella Day

Without gills, cirri, or postsetal lobes. Neuropodium with 2–4 spines and 0–4 spinous capillary setae (Fig. 1*l*) .... *O. nuda* Hobson
(See Hobson 1974, 1976)

Protoariciella Hartmann-Schröder

Gills from setiger 4 or 5 (Fig. 1m), absent on last 28–47 setigers. Most parapodia with forked notosetae .... *P. oligobranchia* Hobson
(See Hobson 1976)

Scoloplos Blainville

The listed species lack single, thick aciculae projecting from abdominal neuropodia. The transition from thorax to abdomen does not occur before setiger 16.

1 With single subpodial lobe (as in Fig. 1a) on posterior thoracic and anterior abdominal segments. (See also Fig. 1n) .... *S. armiger* (Müller)

Without subpodial lobe .... *S. acmeceps* Chamberlin
(See Hartman 1969; Berkeley and Berkeley 1956)

QUESTIDAE

Table 1, fig. B; Fig. 2
Hartman (1969); Hobson (1970)

Parapodia with serrated capillaries and bidentate hooks (as in Fig. 2c), without trifurcate setae. Posterior segments with cirriform gills (as in Fig. 2b) .... *Questa*

Questa Hartman

One recognized species in genus. (See also Fig. 2a–c) .... *Q. caudicirra* Hartman
(See Hobson 1976)

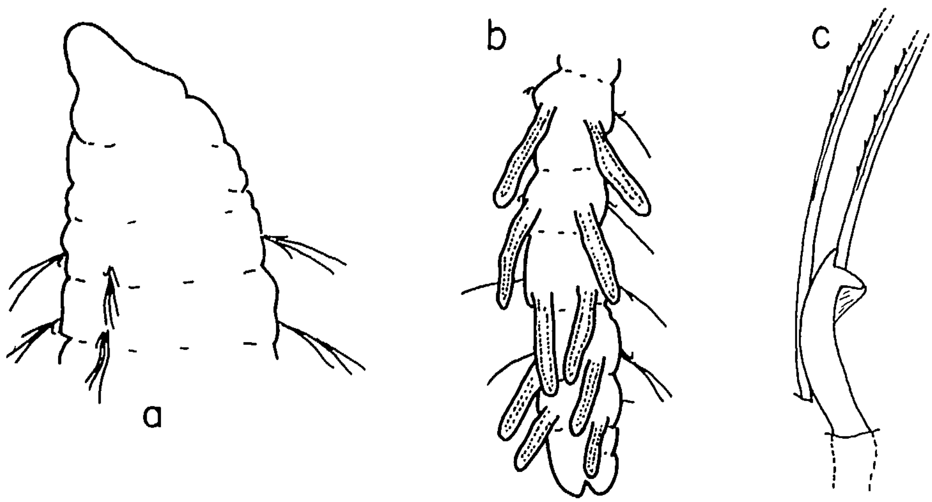


Fig. 2. QUESTIDAE: *Questa caudicirra*: a, anterior end, dorsal view; b, posterior end, dorsal view; c, bidentate hook and basal parts of capillary setae. Source: Hobson (1976) [a, b, modified].

PARAONIDAE

Table 1, fig. C; Fig. 3
Hartman (1957); Strelzov (1973)

Notopodia of posterior segments may be distinguished from neuropodia by the presence of a postsetal lobe (as in Fig. 3o). Setae must be examined with an oil immersion lens. The diagnostic, modified setae may occur on median or posterior setigers.
K. D. Hobson followed Strelzov's (1973) definition of the genera. Neither author was aware of the study by Imajima (1973). Imajima's records and new descriptions were subsequently considered by K. Banse while using Strelzov's generic referrals.

1 Median and posterior notopodia with forked or acicular setae (as in Fig. 3j, k). Median antenna short or absent (as in Fig. 3*l*) .... *Cirrophorus*

Median and posterior notopodia without forked or acicular setae 2

2 With antenna. Nuchal organ not separated from posterior border of head region (as in Fig. 3b, h). Gills from setiger 4 .... *Aricidea*

Without antenna. Nuchal organ separated from posterior border of head region by rudimentary buccal segment (as in Fig. 3n). Gills from setiger 4–8 [local species] or absent 3

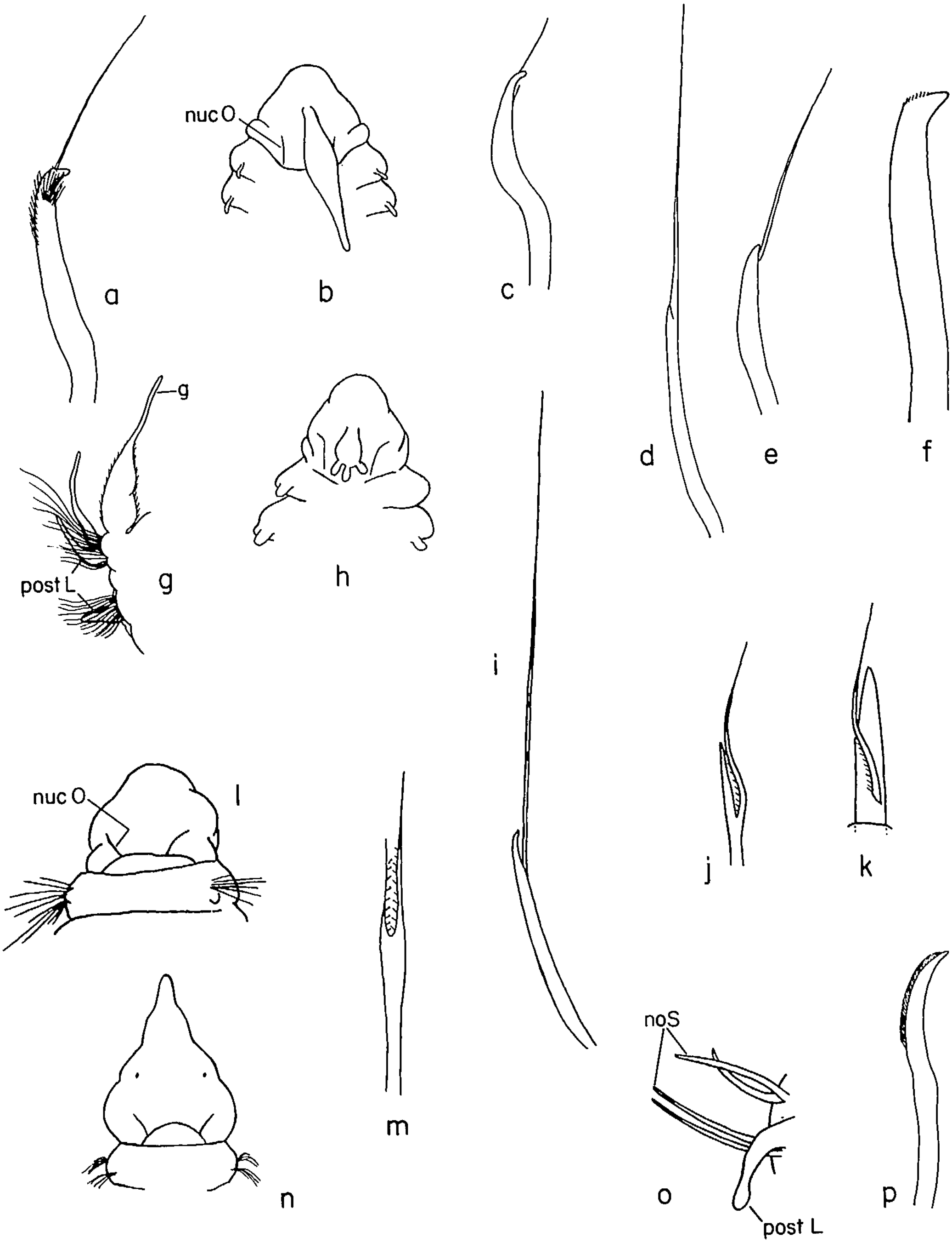


FIG. 3. PARAONIDAE: *Aricidea assimilis*: a, hooked neuroseta. *A. lopezi*: b, anterior end, dorsal view [setae omitted]; c. hooked neuroseta. *A. minuta*: d, pseudocompound neuroseta; e, acicular neuroseta [not hooked]. *A. neosuecica*: f, hooked neuroseta. *A. quadrilobata*: g, anterior parapodium, anterior view. *A. ramosa*: h, anterior end, dorsal view [setae omitted]. *A. wassi**: i, hooked neuroseta. *Cirrophorus branchiatus*: j, forked notoseta from setiger 5; k, acicular notoseta from setiger 45. *C. lyra*: *l*, anterior end, dorsal view; m, forked notoseta. *Paraonella platybranchia*: n, anterior end, dorsal view. *P. spinifera*: o, notopodium from posterior setiger, posterior view. *Tauberia gracilis*: p, hooked neuroseta. Sources: a, *l*, Strelzov (1973); b, j, k, n, original; c, Banse et al. (1968); d, e, Hobson (1976); f, o, Hobson (1972); g, CPF; h, m, p, Banse and Hobson (1968); i, Imajima (1973) [f, h, *l*, modified].

3 Postbranchial neuropodia with hooded hooks (as in Fig. 3p) .... *Tauberia*

Postbranchial neuropodia without hooded hooks .... *Paraonella*

Aricidea Webster

The listed species possess neuropodial modified setae but do not have some posterior gills which are markedly (twice or more) longer than the others.

1 Anterior parapodia with bifid notopodial and conspicuous, entire neuropodial postsetal lobe (Fig. 3g). Antenna long, slender, extending to setiger 6–10 .... *A. quadrilobata* Webster and Benedict
(*A. longicornuta* Berkeley in CPF, see STRELZOV 1973)

Anterior parapodia with entire notopodial postsetal lobe, without neuropodial postsetal lobe 2

2 Antenna branched, short (Fig. 3h) .... *A. ramosa* Annenkova
(See BANSE AND HOBSON 1968)

Antenna not branched 3

3 Antenna jointed 4

Antenna not jointed 5

4 Antenna 2- or 3-jointed, not extending beyond anterior border of setiger 1. Two kinds of modified neurosetae: pseudocompound (Fig. 3d) and acicular with nearly straight distal end and long subterminal, hairlike process on concave side of shaft (Fig. 3e). With 9–14 pairs of broad, leaflike gills .... *A. minuta* Southward
(See STRELZOV 1973; HOBSON 1976)

Antenna 3–6 jointed, extending to setiger 2 or 3. One kind of modified neurosetae: hooked, with long subterminal process on concave side of shaft (Fig. 3i). With 7–18 pairs of cirriform or leaflike gills .... *A. wassi* Pettibone*
(See PETTIBONE 1965; BLAKE AND WALTON 1977, HOBSON 1972, IMAJIMA 1973)

5 Antenna clublike, not extending beyond anterior border of setiger 1. Modified neurosetae hooked, with short distal hairs, without terminal process (Fig. 3f) .... *A. neosuecica* Hartman
(*A. jeffreysii* [not McIntosh] in CPF, see HOBSON 1972)

Antenna tapering distally (as in Fig. 3b), extending to setiger 1–10. Modified neurosetae hooked, with or without distal hairs; with long, slender terminal process at least in posterior setigers (as in Fig. 3a, c). Gill-bearing segments without single papilla posterior to notopodial postsetal lobes 6

6 Modified neurosetae with distal hairs; in posterior setigers [only!] also with terminal process (Fig. 3a) .... *A. assimilis* Tebble
(See Strelzov 1973; Hobson 1976)

Modified neurosetae without distal hairs, with terminal process; occasionally with thin, short subterminal process on concave side of shaft (Fig. 3c). (See also Fig. 3b) .... *A. lopezi* Berkeley and Berkeley
(See Berkeley and Berkeley 1956)

Cirrophorus Ehlers

1 Notopodia with forked setae (Fig. 3j) from about setiger 5, form of setae gradually changing to acicular (Fig. 3k) by setiger 12–15. Gills from setiger 5 [rarely 6] .... *C. branchiatus* Ehlers
(See *Aricidea branchiata* in Berkeley and Berkeley 1956)

Notopodia with forked setae (Fig. 3m) from setiger 4–8, without acicular setae. With 10–16 pairs of gills, from setiger 4. Notopodial postsetal lobe uniform in length to end of gill-bearing region. (See also Fig. 3*l*) .... *C. lyra* (Southern)
(See Strelzov 1973; *Paraonis lyra* in Banse and Hobson 1968)

Paraonella Strelzov

1 Posterior setigers with spinelike notosetae (Fig. 3o). With 12–20 pairs of gills, from setiger 5 or 6. Prostomium bluntly triangular, without eyespots .... *P. spinifera* (Hobson)
(See *Paraonis spinifera* in Hobson 1972)

Posterior setigers without spinelike notosetae. With 16–29 pairs of gills, from setiger 4. Prostomium long and pointed, with 2 small black eyespots (Fig. 3n) .... *P. platybranchia* (Hartman)
(See Hobson 1976)

Tauberia Strelzov

The Commission of Zoological Nomenclature has meanwhile declared *Tauberia* to be a junior synonym of *Levinsenia* Mesnil (Bull. Zool. Nomencl. 36: 114–118, 1979).

With 10–16 pairs of gills [length more than 3 times width], from setiger 6 or 7 [5–8]. Without eyespots. Modified neurosetae hooked, indistinctly hooded (Fig. 3p) .... *T. gracilis* (Tauber)
(*Paraonis ivanovi* Annenkova in Banse and Hobson 1968, see Strelzov 1973)

The local form may be referable to *T. gracilis minuta* (Hartmann-Schröder). This subspecies is recognized by Imajima (1973) [as *Paraonides gracilis minuta*] but not by Strelzov (1973).

APISTOBRANCHIDAE

Table 1, fig. D
ORRHAGE (1962); PETTIBONE (1963a)

One recognized genus in family .... *Apistobranchus*

Apistobranchus Levinsen

1 Neuropodial postsetal lobe on setiger 4 coarsely serrated [with 3–6 teeth in animals wider than about 0.55 mm] (as in Table 1, fig. D). Notopodia often missing on some or all setigers 7–11 .... *A. tullbergi* (Théel)
(See PETTIBONE 1963a; questionable record in BANSE 1972a)

Neuropodial postsetal lobe on setiger 4 not serrated, with pointed or bifid ventral tip. Notopodia present on setigers 7–11 .... *A. ornatus* Hartman
(See HARTMAN 1965b; BANSE 1972a)

SPIONIDAE

Table 1, fig. E; Fig. 4–6
BLAKE AND KUDENOV (1978); FOSTER (1971); LIGHT (1978a)

Notopodial hooks, if present, usually begin more posteriorly than neuropodial hooks. A gill usually may be distinguished from the notopodial postsetal lobe by the presence of a blood vessel (see Fig. 4a). The gills on setiger 1 may be small and easily overlooked. The dorsal sense organ [termed caruncle by some authors] is a posterior extension of the prostomium (see Fig. 4m). Genital pouches in median, and sometimes also anterior, segments are pocketlike structures of large skin folds between successive neuropodia, opening upwards (as in Fig. 4e).

1 Setiger 5 modified (as in Fig. 4k) [may be slightly modified, as in Fig. 5c], with stout hooks .... *Polydora*

Setiger 5 not modified, without stout hooks 2

2 Without gills (as in Fig. 6k). Setiger 1 with stout curved neuroseta .... *Spiophanes*

With gills (as in Fig. 6d). Setiger 1 without stout, curved neuroseta 3

3 With 1 pair of gills [on setiger 1]. Setiger 2 with raised dorsal membrane (as in Fig. 6m) .... *Streblospio*

With more than 1 pair of gills 4

4 Gills beginning after setiger 10 [sometimes with 1 pair of gill-like cirri on setiger 2 of males] .... *Pygospio*

Gills beginning on setiger 1 or 2 5

5 Notopodial postsetal lamellae of first 2–3 parapodia with one to several lobes (as in Fig. 4b [NE Pacific species]). Posterior notopodia with digitiform accessory gills on posterior surfaces (as in Fig. 4c) .... *Dispio*†

Notopodial postsetal lamellae of anterior parapodia entire (similar to Fig. 4a). Posterior notopodia without accessory gills 6

6 With gills on anterior half or less of body 7

With gills on most of body 10

7 Hooded hooks bi- or tridentate [side view]. Gills simple 8

Hooded hooks multidentate (as in Fig. 6a [listed species]). Gills simple or pinnate 9

8 Dorsal sense organ long, extending over several to many segments. With genital pouches (as in Fig. 4e [check median region]). Gills present through median region .... *Laonice*

Dorsal sense organ short [prostomial extension not beyond setiger 2 or 3]. Without genital pouches. Gills (as in Fig. 4a) present only anteriorly .... *Aonides*†

9 Gills pinnate, beginning on setiger 1 [3 pairs]. Prostomium surrounded by well-developed hood (as in Fig. 4g) .... *Paraprionospio*

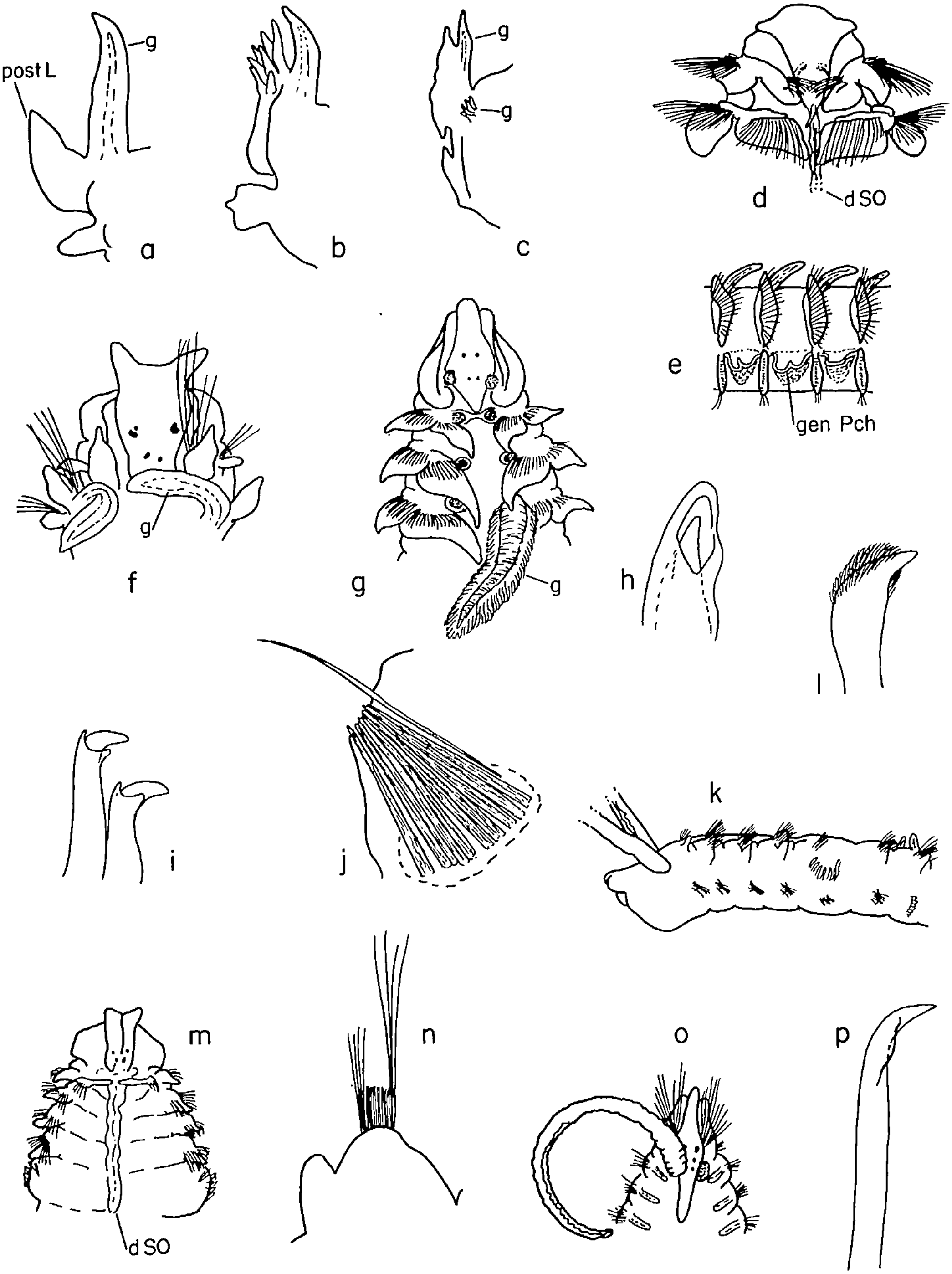
Gills simple and/or pinnate, beginning on setiger 2 [2–40 pairs]. Prostomium not surrounded by hood .... *Prionospio*

10 Prostomium with distinct anterolateral projections (as in Fig. 4f). Median and posterior notopodia without hooded hooks .... *Malacoceros*

Prostomium without anterolateral projections. Median and posterior notopodia with or without hooded hooks 11

11 Prostomium anteriorly pointed (as in Fig. 6d [may be blunt in *Scolelepis foliosa*]). Gills beginning on setiger 2. Median and posterior notopodia usually with hooded hooks. Pygidium with oval disk .... *Scolelepis*

Prostomium anteriorly blunt or rounded (as in Fig. 4g, 6k) or slightly bilobed (as in Fig. 4m). Gills beginning on setiger 1 or 2. Median and posterior notopodia without hooded hooks. Pygidium with cirri [4 indistinct lobes in *Spio butleri*] .... *Spio*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Laonice Malmgren

The listed species have hooded hooks only in the neuropodia.

1 Genital pouches (as in Fig. 4e) beginning on setiger 2–7. Dorsal sense organ extending to about setiger 25. Behind gill-bearing region, dorsal ridges connecting notopodia inconspicuous .... *L. pugettensis* Banse and Hobson
(See BANSE AND HOBSON 1968)

Genital pouches beginning on setiger 12–35 [or later?]. With conspicuous eyes (Fig. 4d [may fade in preservative]). Posterior neuropodia with numerous [> 10] hooded hooks. (See also Fig. 4e) .... *L. cirrata* (Sars)
Because of differences in the shape of the neuropodial hooks, the Pacific species may not be identical with the European *L. cirrata* (see BANSE AND HOBSON 1968).

Malacoceros Quatrefages

1 Gills beginning on setiger 1. Subgenus *Malacoceros.*
Neuropodial hooded hooks bidentate, beginning on setiger 30–45 ....
.... *M. fuliginosus* (Claparède)
(See FAUVEL 1927; BERKELEY AND BERKELEY 1956 [*Scolelepis fuliginosa* in both])

Gills beginning on setiger 2 (as in Fig. 4f). Subgenus *Rhynchospio.*
Neuropodial hooded hooks tridentate, beginning on setiger 13–21 [usually on 18–19]. (See also Fig. 4f) .... *M. glutaeus* (Ehlers)
(*Rhynchospio* cf. *arenincola* Hartman in WIESER 1959; *R. arenincola* in BANSE 1963; see FOSTER 1971 for synonymy)

Paraprionospio Caullery

Neuropodial hooded hooks beginning on setiger 9–11. (See also Fig. 4g) ......
.... *P. pinnata* (Ehlers)
(*Prionospio pinnata* in CPF, see FOSTER 1971)

FIG. 4. SPIONIDAE: *Aonides*† sp.: a, anterior parapodium, anterior view [setae omitted]. *Dispio uncinata*†: b, parapodium 1, anterior view; c. posterior parapodium, posterior view [setae omitted in both]. *Laonice cirrata*: d, anterior end, dorsal view [palps lost]; e, median segments, lateral view. *Malacoceros glutaeus*: f, anterior end, dorsal view [palps omitted; setae schematically drawn on right parapodium 1 and left parapodium 2]. *Paraprionospio pinnata*: g, anterior end, dorsal view [showing one gill and attachment scars of lost gills and palps]. *Polydora alloporis*: h, tip of stout hook of setiger 5. *P. armata**: i, falcate stout hooks of setiger 5, with collar; j, bundle of spines in posterior notopodium. *P. brachycephala*: k, anterior end, lateral view of *P. caulleryi* Mesnil† [as adult almost indistinguishable from *P. brachycephala*]: *l*, bushy-tipped stout hook of setiger 5. *P. cardalia*: m, anterior end, dorsal view [palps lost]; n, posterior notopodium, dorsal view. *P. columbiana*: o, anterior end, dorsal view [right palp lost]. *P. commensalis*: p, falcate stout hook of setiger 5, with sheath. Sources: a, f, Foster (1971); b, c, *l*, Light (1978a); d, Moore (1907); e, CPF; g, m, o, Berkeley (1927); h, Light 1970; i, Hartman (1969); j, Mesnil (1896); k, p, Blake (1971); n, Blake (1979) [all modified].

Polydora Bosc

BLAKE (1971); BLAKE AND WOODWICK (1971)

To recognize bundles of small notosetae on setiger 1, palps may need to be removed. The stout hooks on setiger 5 may be worn (see Fig. 5p) so new setae [tips only formed] should be studied. Further, the hooks must be examined from all angles to determine their form. This can be accomplished by placing several excised individual setae in liquid on a microscope slide and then slowly rolling them under the coverslip during examination. Hooded [neuropodial] hooks in the listed species are bidentate (as in Fig. 6j [not uni- or tridentate]). Most recent workers regard the subgenera used here as genera. The generic revision by Blake and Kudenov (1978) was received too late to be considered.

1 Gills beginning on setiger 2 [usually absent on setiger 5]. Subgenus *Boccardia* 2

Gills beginning after setiger 5 6

2 Setiger 5 with only smooth falcate stout hooks (as in Fig. 5j). With thick recurved spines in posterior notopodia (Fig. 5b). Gills present on setigers 2, 3, 6, and subsequent segments .... *P. hamata* Webster
(*P. uncata* Berkeley in CPF, see *Boccardia hamata* in BLAKE 1966)

Setiger 5 with both smooth falcate (as in Fig. 5j) and bushy-tipped stout hooks (as in Fig. 5i). Without thick spines in posterior notopodia 3

3 Prostomium notched anteriorly (as in Fig. 5f). Bushy-tipped stout hooks with spinelets continuing basally below thickest part (as in Fig. 5k [except *P. proboscidea*]) 4

Prostomium not notched anteriorly (as in Fig. 4o). Bushy-tipped stout hooks without spinelets continuing basally below thickest part (as in Fig. 5i) 5

4 Setiger 1 with notosetae. Gills on setigers 2–4 extending almost to midline of dorsum. (See also Fig. 5k) .... *Polydora pugettensis* Blake
(*Polydora natrix* [not Söderström] in CPF and BANSE ET AL. 1968, see BLAKE 1979)

Setiger 1 without notosetae .... *P. polybranchia* Haswell

5 Notosetae of setiger 1 long, projecting beyond anterior edge of prostomium (Fig. 4o) .... *P. columbiana* Berkeley

Notosetae of setiger 1 short, inconspicuous. (See also Figs. 5i, j) .... *P. proboscidea* Hartman

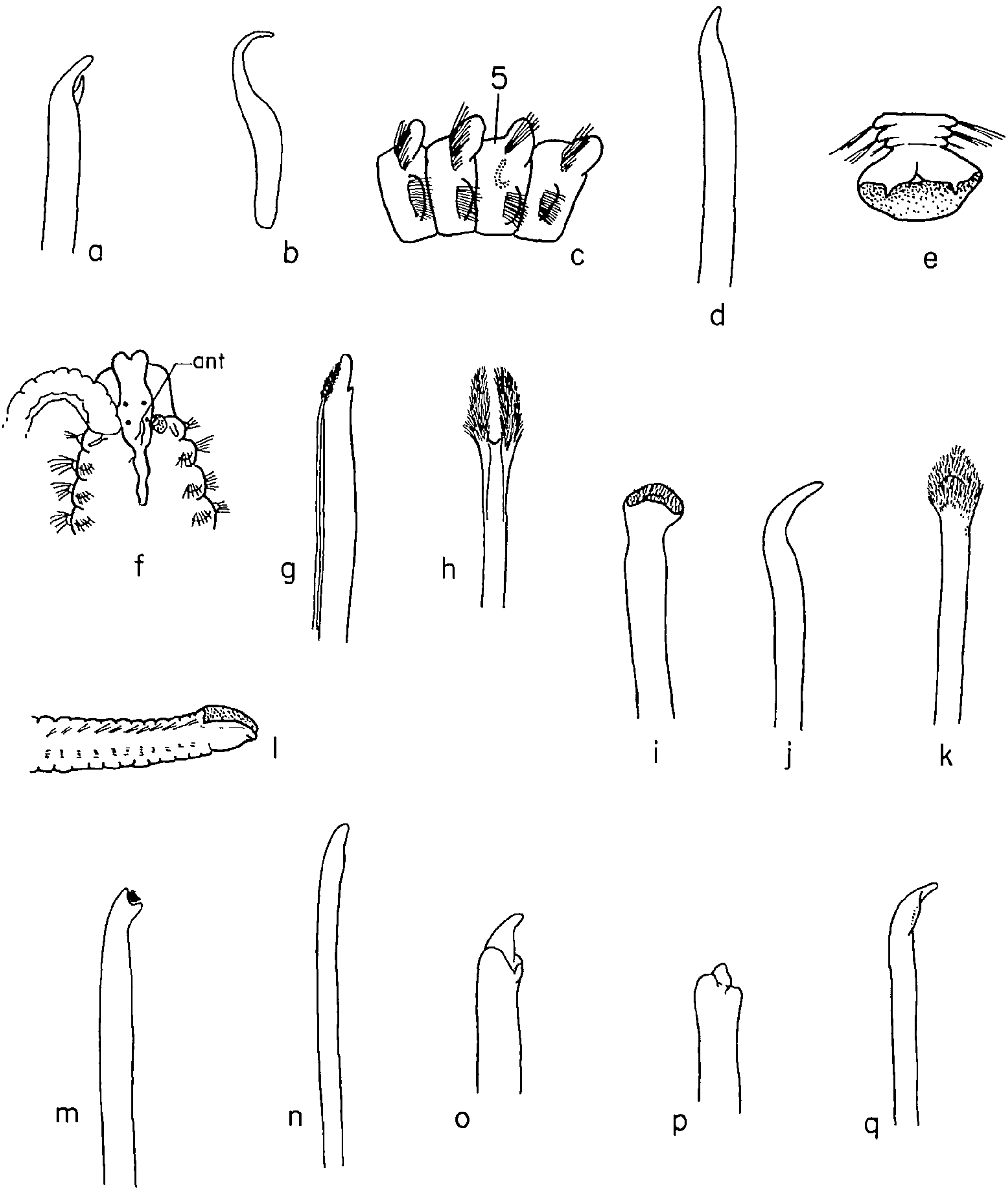


FIG. 5. SPIONIDAE: *Polydora giardi**: a, toothed stout hook of setiger 5. *P. hamata*: b, recurved spine of posterior notopodium. *P. kempi japonica*: c, setigers 3–6, lateral view; d, falcate stout hook of setiger 5; e, pygidium, dorsal view. *P. ligni*: f, anterior end, dorsal view; g, toothed stout hook and companion seta of setiger 5; h, companion seta of setiger 5. *P. proboscidea*: i, bushy-tipped stout hook of setiger 5; j, falcate stout hook of setiger 5. *P. pugettensis*: k, bushy-tipped stout hook of setiger 5. *P. pygidialis*: *l*, pygidium, lateral view. *P. quadrilobata*: m, bushy-tipped stout hook of setiger 5. *P. socialis*: n, smooth stout hook of setiger 5. *P. spongicola*: o, unworn stout hook of setiger 5; p, worn stout hook of setiger 5. *P. websteri**: q, falcate stout hook of setiger 5 with sheath. Sources: a, i, Hartman (1969); b, Berkeley (1927); c–e, Okuda (1937); f, CPF; g, m, n, q, Blake (1971); h, Söderström (1920); j, Hartman (1941a); k, Blake (1979); *l*, Blake and Woodwick (1972); o, p, Berkeley and Berkeley (1950) [b, e, f, i, j, *l*–n, q, modified].

6 Setiger 5 not highly modified: noto- and neuropodial postsetal lobes and fascicles well developed (as in Fig. 5c). Stout hooks of setiger 5 in U-shaped line (as in Fig. 5c). Hooded hooks beginning on setiger 8. Subgenus *Pseudopolydora*.
Prostomium notched anteriorly, without lateral outgrowths, with median antenna. 15–20 pairs of gills. Stout hooks of setiger 5 smooth, falcate (Fig. 5d), 23–27 on each side. Pygidium funnel shaped, with small cirrus on each side of dorsal notch (Fig. 5e). (See also Fig. 5c) .... *P. kempi japonica* Imajima and Hartman

(*Neopygospio laminifera* BERKELEY AND BERKELEY 1954, see BANSE 1972a)

Setiger 5 highly modified: noto- and neuropodial postsetal lobes and setal fascicles absent or poorly developed (as in Fig. 4k). Stout hooks of setiger 5 usually in straight or only slightly curved line. Hooded hooks beginning on setiger 7 [10–17 in *P. commensalis*]. Subgenus *Polydora* 7

7 Stout hooks of setiger 5 with bushy tip (as in Fig. 4*l*, 5m) 8

Stout hooks of setiger 5 without bushy tip 9

8 Stout hooks of setiger 5 falcate, with apical bushy ridge (Fig. 4*l*). (See also Fig. 4k) .... *P. brachycephala* Hartman

(*P. caulleryi* Mesnil?, in BANSE ET AL. 1968, see LIGHT 1978a)

Stout hooks of setiger 5 nearly straight, bifid, with bushy tuft between teeth (Fig. 5m) .... *P. quadrilobata* Jacobi

(See BLAKE 1971; HOBSON 1977)

9 Stout hooks of setiger 5 with collar, sheath, or tooth (as in Fig. 4i, p; 5a). Setiger 1 with or without notosetae 10

Stout hooks of setiger 5 smooth, without collar, sheath, or tooth (as in Fig. 5n). Setiger 1 with notosetae 18

10 Gills beginning on setiger 6; hooded hooks beginning on setiger 10–17. Stout hooks of setiger 5 falcate, with sheath (Fig. 4p). Setiger 1 with notosetae. Without dorsal sense organ. Palps very short, about length of first 4 or 5 setigers .... *P. commensalis* Andrews

Gills beginning on setiger 7–10; hooded hooks beginning on setiger 7 11

11 Setiger 1 with notosetae. Posterior notopodia with or without modified [non-capillary] setae 12

Setiger 1 without notosetae. Posterior notopodia with only capillary setae 13

12 Stout hooks of setiger 5 with subapical collar (Fig. 4i). Posterior notopodia each with conelike fascicle of spines (Fig. 4j). Gills beginning on setigers 7–12. Dorsal sense organ to setiger 2 [not 4] .... *P. armata* Langerhans*
(See HARTMAN 1969)

Stout hooks of setiger 5 with lateral tooth (Fig. 5a). Posterior notopodia with only capillary setae .... *P. giardi* Mesnil
(See HARTMAN 1969; HOBSON 1977)

13 Prostomium with median antenna (Fig. 5f). Stout hooks of setiger 5 with small lateral tooth (Fig. 5g) and with closely adhering forked companion seta (Fig. 5g, h) .... *P. ligni* Webster

Prostomium without median antenna 14

14 Stout hooks of setiger 5 with lateral tooth 15

Stout hooks of setiger 5 without lateral tooth, with collar or sheath (as in Fig. 5o, q) 16

15 Palps with 4–5 transverse black bars. Prostomium notched anteriorly (as in Fig. 5f) .... *P. limicola* Annenkova*
(See HARTMAN 1969)

Palps without black bars. Prostomium rounded anteriorly. Pygidium markedly scoop shaped (Fig. 5*l*) .... *P. pygidialis* Blake and Woodwick
(*P. ciliata* [not Johnston] in CPF, see BLAKE AND WOODWICK 1972)

16 Prostomium notched anteriorly (as in Fig. 4m). Stout hooks of setiger 5 falcate, with sheath (Fig. 5q) .... *P. websteri* Hartman*
(See HARTMAN 1969)

Prostomium rounded anteriorly 17

17 Stout hooks of setiger 5 with subapical concavity bordered laterally and ventrally by a continuous flange (Fig. 4h) .... *P. alloporis* Light
(See LIGHT 1970)

Stout hooks of setiger 5 with collar (Fig. 5o) [may appear apically knobbed when worn (Fig. 5p)] .... *P. spongicola* Berkeley and Berkeley
(*P. ciliata spongicola* in CPF, see WOODWICK 1963)

18 Posterior notopodia with up to about 18 nonlimbate setae much finer than limbate setae, clearly protruding from cuticula (Fig. 4n). Dorsal sense organ extending to setiger 5–6 (Fig. 4m). Setiger 5 with 12 or more stout hooks .... *P. cardalia* Berkeley

(In CPF, see also BLAKE 1979)

Posterior notopodia with several nonlimbate setae half to nearly as stout as limbate setae [not acicular spines]. Dorsal sense organ extending to setiger 4–12. Setiger 5 with 3–7 emergent stout hooks. (See also Fig. 5n) .... *P. socialis* (Schmarda)

(*P. caeca* [not Oersted], *P. socialis plena* Berkeley and Berkeley, and *P. magna* Berkeley and Berkeley in CPF, see BLAKE 1979)

Prionospio Malmgren

As gills are lost easily, it may be necessary to examine several specimens to determine the true arrangement of the gills.

1 With 7–10 pairs of cirriform gills. Neuropodial hooded hooks beginning on setigers 12–13. With large reddish eyes. With genital pouches (as in Fig. 4e [difficult to make out; from setiger 5 to 7 for about 20 segments in Arctic material, Söderström 1920]) .... *P. cirrifera* Wirén

An unidentified species with 10–12 pairs of cirriform gills was found by J. M. Orensanz in an intertidal sample from Skiff Point, Bainbridge I. (approx. 47°40′N; 122°30′W; April 1979. K. Chew coll.). Neuropodial hooded hooks occur from setigers 17–21. The eyes are small and black (as in Fig. 4g). Genital pouches are absent. [This addition to the fauna of Washington is not considered in the biogeographic section.]

With 4 pairs of gills: pairs 1 and 4 pinnate, pairs 2 and 3 cirriform. Neuropodial hooded hooks beginning on setiger 14–21 [usually 15–17]. About 15–25 post-branchial setigers without or with consistently low [not noticeably higher on setiger 7, or 7 and 9] transverse ridges dorsally between notopodial postsetal lobes (see also Fig. 6a) .... *P. steenstrupi* Malmgren

(*P. malmgreni* [not Claparède] in CPF, see also FOSTER 1971)

Possibly, *P. fallax* Söderström, with gills as in *P. steenstrupi* but with a high dorsal, membranous fold between gills on setiger 7, also occurs in the area (see FOSTER 1971: 87).

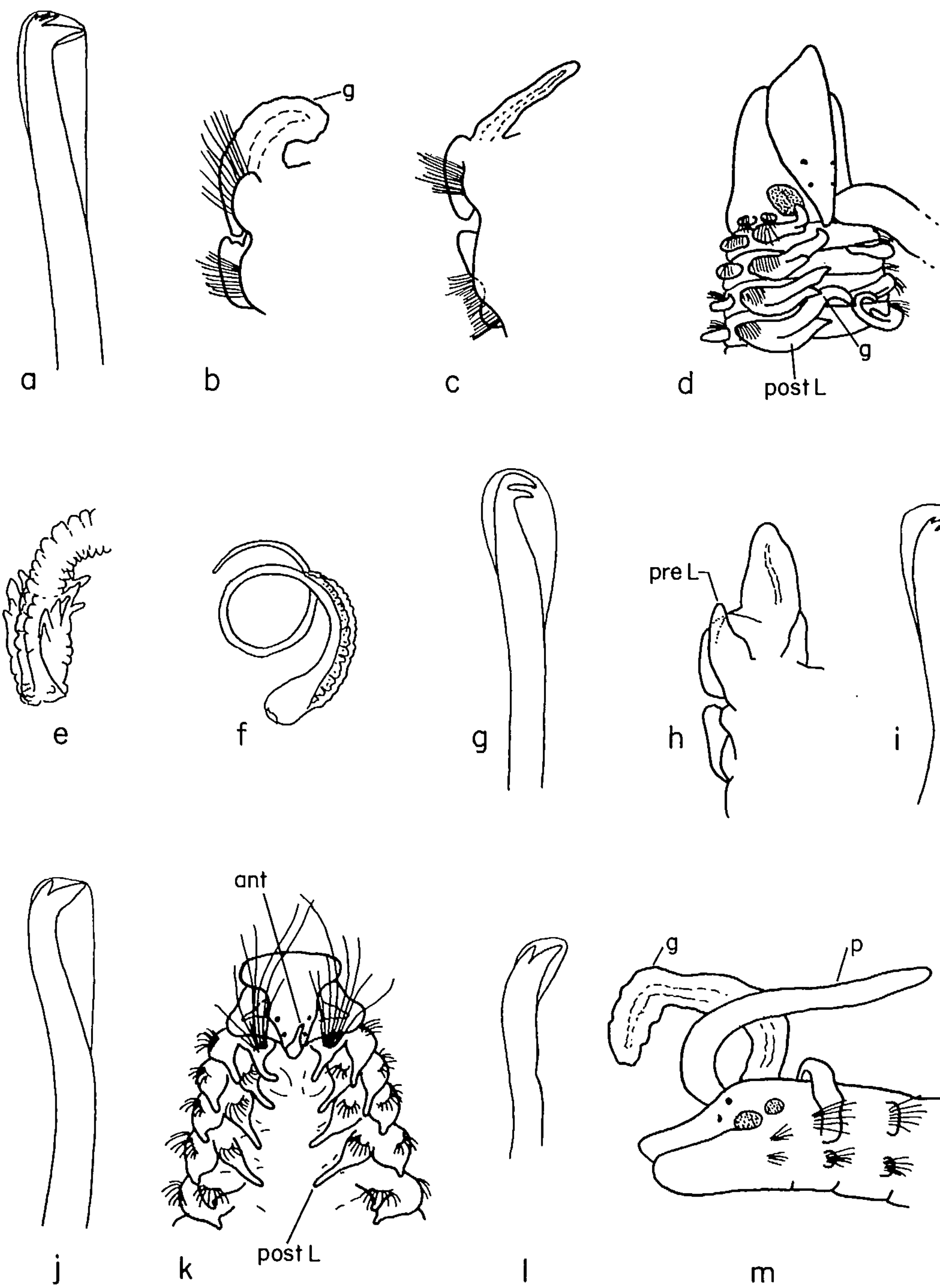
Pygospio Claparède

Prostomium blunt or bilobed anteriorly. Gills beginning on setiger 11–13 [setiger 2 in males with gill-like cirrus]. Neuropodial hooded hooks beginning on setiger 8–9 [rarely 7] .... *P. elegans* Claparède

(See FOSTER 1971; HOBSON 1977)

Some specimens from British Columbia with pointed prostomia, gills beginning on setiger 14–16 and neuropodial hooded hooks beginning on setiger 11–18 are intermediate between *P. elegans* and *P. californica* Hartman† (HOBSON 1977).

FIG. 6. SPIONIDAE: *Prionospio steenstrupi*: a, notopodial multidentate hooded hook. *Scolelepis foliosa*: b, anterior parapodium, anterior view; c, posterior parapodium, anterior view. *S. squamata*: d, anterior end, dorsal view [left palp lost]; e, *S. yamaguchii* Imajima†, base of palp. *Spio butleri*: f, palp; g, hooded hook. *S. cirrifera*: h, parapodium 10, anterior view [setae omitted]; i, tridentate hooded hook. *S. filicornis*: j, bidentate hooded hook. *Spiophanes berkeleyorum*: k, anterior end, dorsal view [palps lost]. *S. bombyx*: *l*, bidentate hooded hook. *Streblospio benedicti*: m, anterior end, lateral view [left palp and gill lost]. Sources: a, j, Söderström (1920); b–d, Hartmann-Schröder (1971); e, Imajima (1959); f, g, Berkeley and Berkeley (1954); h, i, Banse and Hobson (1968); k, CPF; *l*, Fauvel (1927); m, combined from Hartman (1936) and Foster (1971) [b–e, h, *l*, modified].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Scolelepis Blainville

LIGHT (1977, 1978a); PETTIBONE (1963b)

Nerine Johnston is included in this genus (see Pettibone 1963b). Listed species usually have notopodial hooded hooks.

1 Hooded hooks unidentate or blunt. Prostomium with occipital papilla or antenna. Palps without sheath and short cirri around bases [not as in Fig. 6e]. Gills completely fused with notopodial postsetal lobe in anterior setigers (Fig. 6b), partly fused in posterior setigers (Fig. 6c). Parapodial lips of middle and posterior setigers lamelliform (similar to Fig. 4e [not short, thick, and glandular]). Neuropodial hooks from about setiger 60 [not 30] .... *S. foliosa* (Audouin and Milne-Edwards)

The phrasing is to exclude the incompletely known *S. alaskensis* (TREADWELL 1914) which presumably occurs in Washington.

Hooded hooks bi- or tridentate [not multidentate as in Fig. 6a; rarely few unidentate]. Prostomium without antenna. All gills partly fused with notopodial postsetal lobe (Fig. 6d) .... *S. squamata* (Müller)

(*Nerine cirratulus* (delle Chiaje) in CPF, see FOSTER 1971, LIGHT 1978a)

Specimens from Washington may represent a new subspecies as the gills are completely, not partially, fused with the notopodial postsetal lobe. The sole specimen collected by Berkeley and Berkeley from British Columbia (see CPF) is too poorly preserved for re-identification.

Spio Fabricius

Paraspio Czerniavsky is included in this genus (see Foster 1971; Giordanella 1969).

1 Gills beginning on setiger 2 .... Subgenus *Microspio*†

Gills beginning on setiger 1. Subgenus *Spio* 2

2 Hooded hooks tridentate (one tooth minute, Fig. 6i), beginning on setiger 16 or 17. Gills on setiger 1 very small. With well-developed notopodial presetal lobe in anterior region (Fig. 6h) .... *S. cirrifera* (Banse and Hobson)

(See *Paraspio cirrifera* in BANSE AND HOBSON 1968)

Hooded hooks bidentate [side view]. Gills on setiger 1 about the same size as on following setigers [may be only half as large in *Spio butleri*] 3

3 Hooded hooks beginning on setiger 10–15; axes of teeth of all hooks divergent, with teeth of unequal length (Fig. 6j). Palps with simple longitudinal groove. Prostomium anteriorly blunt (as in Fig. 4g), to slightly pointed .... *S. filicornis* (Müller)

(*S. filicornis pacifica* in CPF, see HARTMAN 1948)

Hooded hooks beginning on setiger [19] 22–24; axes of teeth of upper neuropodial hooks parallel, with teeth of nearly same length (Fig. 6g). Palps [sometimes] with two parallel, fringed membranes (Fig. 6f) .... *S. butleri* Berkeley and Berkeley

(See BERKELEY AND BERKELEY 1954)

The species is newly recorded here from the mouth of the Columbia River estuary, in fairly clean sand (R. L. Emmett coll. 1979, 1 specimen).

Spiophanes Grube

FOSTER (1971); PETTIBONE (1962)

Listed species have long, dorsally pointed postsetal lobes on setigers 1–4.

1 Prostomium anteriorly with elongate lateral projections, without median antenna. Neuropodial hooks bidentate [usually] or tridentate, with reduced hood (Fig. 6*l*). Pygidium with 2 cirri .... *S. bombyx* (Claparède)

Prostomium anteriorly with blunt lateral projections, with median antenna (as in Fig. 6k). Neuropodial hooks quadridentate [tridentate in profile], without hood 2

2 With genital pouches, beginning on setiger 15–19. With 5–7 hooks per neuropodium. Pygidium with 6 cirri .... *S. kroyeri* Grube

(*S. cirrata* Sars, in part, in CPF, see HOBSON 1977)

According to PETTIBONE (1962), *S. cirrata* Sars is a synonym of this species.

Without genital pouches. With 6–11 hooks per neuropodium. Pygidium with 8–12 cirri. (See also Fig. 6k) .... *S. berkeleyorum* Pettibone

(*S. cirrata* in CPF, in part, see PETTIBONE 1962, also HOBSON 1977)

Streblospio Webster

As in generic diagnosis. (See also Fig. 6m) .... *S. benedicti* Webster

(See FOSTER 1971; HOBSON 1977)

TROCHOCHAETIDAE

Table 1, fig. F

PETTIBONE (1976)

One recognized genus in family .... *Trochochaeta*

Trochochaeta Levinsen

Postsetal lobes serrated from setiger 3 [setiger 2 is first one with acicular spines] (as in Table 1, fig. F). Notopodial postsetal lobe on setiger 3 with several serrations .... *T. multisetosa* (Oersted)

(See BANSE AND HOBSON 1968)

POECILOCHAETIDAE†

Table 1, fig. G
FAUCHALD (1977); PILATO AND CANTONE (1976)

Setae of segment 1 directed forward, extending beyond prostomium .... *Poecilochaetus*†

MAGELONIDAE

Table 1, fig. H; Fig. 7
JONES (1963, 1971, 1978)

The prostomium must be flattened for study. Remove parapodia with setae for observation in plane (transverse) view. Use an oil immersion lens for examination of setae, and study hooks (as in Fig. 7i) edge-on.
Lateral lamellae are extended postsetal lobes. The posterior region starts on setiger 10.

One recognized genus in family .... *Magelona*

Magelona Müller

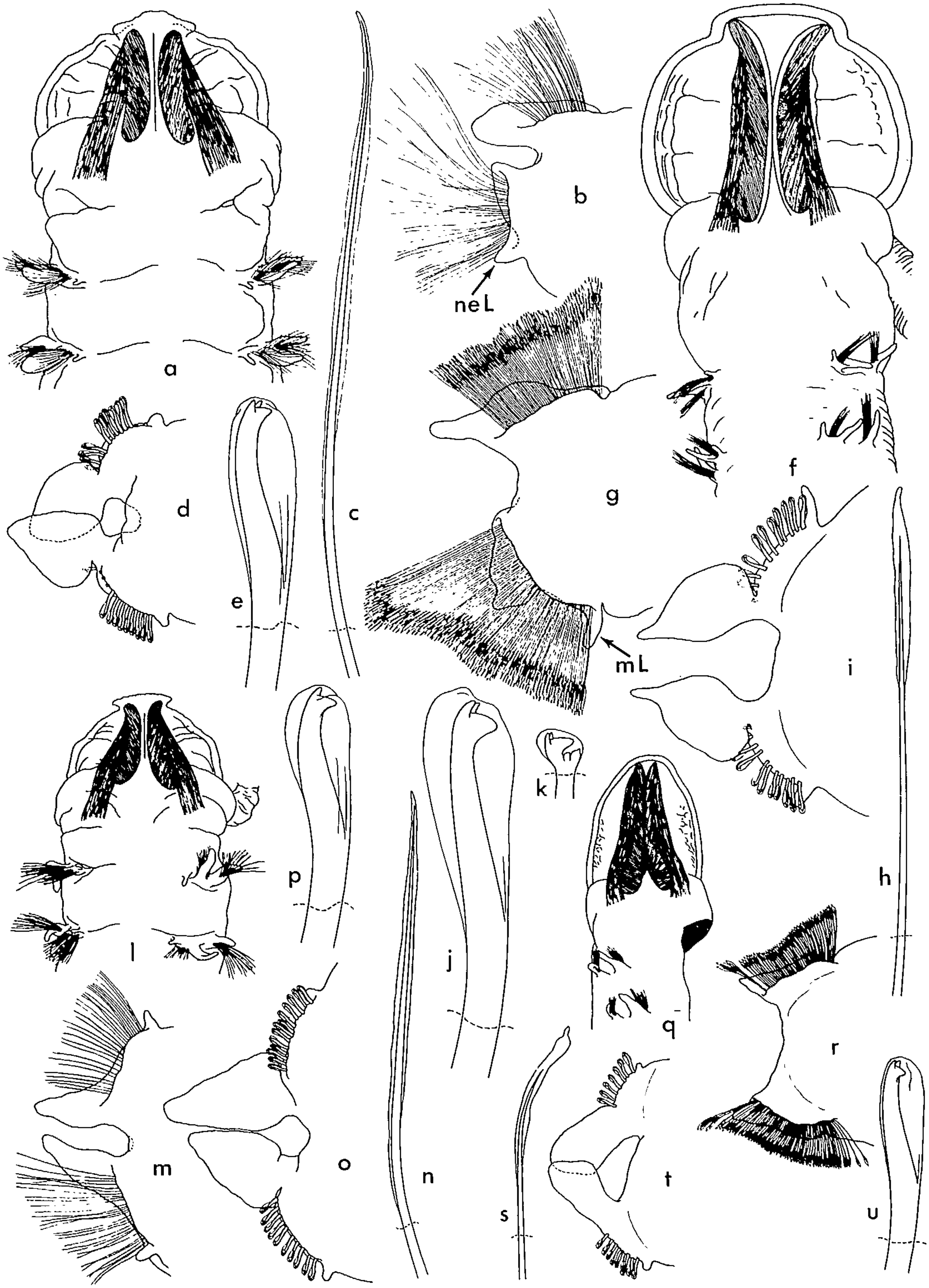
1 Setae of parapodium 9 special [different from those of setigers 1–8]. Parapodia 1–8 with 2 lateral lamellae. With or without anterior prostomial horns 2

Setae of parapodium 9 as of parapodia 1–8 (as in Fig. 7c, n). Parapodia 1–8 with 1 or 2 lateral lamellae. With anterior prostomial horns (as in Fig. 7a, *l*) 3

2 Special setae with mucronate tips (Fig. 7s). Parapodium 9 without ventral medial lobe (Fig. 7r). Prostomium without anterior horns (Fig. 7q). With lateral pouches between setigers 10 and 11 (as in Table 1, fig. H). Hooded hooks of posterior region of about same size (Fig. 7t), with tridentate tips (Fig. 7u) .... *M. sacculata* Hartman
(See HARTMAN 1961; ARMSTRONG ET AL. 1977)

Special setae with pennoned tips (Fig. 7h). Parapodium 9 with ventral medial lobe (Fig. 7g). Prostomium with truncated anterior margin, suggesting reduced anterior horns (Fig. 7f). Without lateral pouches between setigers 10 and 11. Hooded hooks of posterior region not of same size (Fig. 7i): mostly large (Fig. 7j), except for single, occasionally 2, very small (Fig. 7k) at bases of lateral lamellae; both kinds with tridentate tips .... *M. hobsonae* Jones
(*M. pitelkai* [not Hartman] in CPF, see JONES 1978)

FIG. 7. MAGELONIDAE: *Magelona berkeleyi*: a, anterior end, dorsal view [palps lost]; b, parapodium 9, anterior view; c, seta from same; d, parapodium 10, anterior view; e, tridentate hooded hook. *M. hobsonae*: f, anterior end, dorsal view [left palp lost]; g, parapodium 9, anterior view; h, pennoned seta from same; i, parapodium 10, anterior view; j, large tridentate hooded hook, k, tip of small tridentate hooded hook. *M. longicornis*: *l*, anterior end, dorsal view [left palp lost]; m, parapodium 9, anterior view; n, seta from same; o, parapodium 10, anterior view; p, bidentate hooded hook. *Magelona sacculata*: q, anterior end, dorsal view [body with setigers 1 and 2 twisted to right; right parapodia removed, palps lost]; r, parapodium 9, anterior view; s, mucronate seta from same; t, parapodium 10, anterior view; u, tridentate hooded hook. Sources: a–e, *l*–p, Jones (1971); f–k, Jones (1978); q–u, original (specimen from southern California) [m, o, modified].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3 Noto- and neuropodial hooded hooks of posterior region tridentate (Fig. 7e), in 2 series, facing each other (Fig. 7d). Parapodium 9 with ventral neuropodial lobe and dorsal lateral lamella (Fig. 7b). (See also Fig. 7a, c) .... *M. berkeleyi* Jones
(See JONES 1971)

Noto- and neuropodial hooded hooks of posterior region bidentate (Fig. 7p), in single series (Fig. 7o). Parapodium 9 with dorsal and ventral medial lobes and dorsal and ventral lamellae (Fig. 7m). (See also Fig. 7*l*, n) .... *M. longicornis* Johnson
(*M. japonica* [not Okuda] in CPF, see JONES 1971)

HETEROSPIONIDAE†

Table 2, fig. A
FAUCHALD (1977); HARTMAN (1956b); IMAJIMA (1974)

One recognized genus in family .... *Heterospio*†

CHAETOPTERIDAE

Table 2, fig. C; Fig. 8
GITAY (1969); KUDENOV (1975); POTTS (1914)

Three regions of the body (see Table 2, fig. C; Fig. 8a) are identified by the absence or the kind of notopodia: anterior without notopodia, middle with uni-, bi-, or trilobed notopodia (as in Fig. 8c), and posterior with unilobed notopodia. Badly torn specimens may be identified to the generic level by the acicular setae of setiger 4 (see Kudenov 1975 and note under *Phyllochaetopterus* herein).

1 Anterior end with 1 pair of small tentacular cirri at base of palps [often difficult to see] (as in Fig. 8b). Palps much longer than anterior region .... *Phyllochaetopterus*

Anterior end without tentacular cirri (as in Fig. 8a). Palps of variable length 2

2 Palps shorter than anterior region. Some notopodia of middle region fused dorsally, paddlelike (as in Fig. 8a) .... *Chaetopterus*

Palps longer than anterior body region. Notopodia of middle region not fused dorsally (as in Table 2, fig. C) 3

3 Notopodia of middle region unilobed (as in Table 2, fig. C). Setiger 4 with several acicular setae (as in Table 2, fig. C). Tube not semitransparent or ringed, usually covered with sand or shell .... *Mesochaetopterus*

Notopodia of middle region bi- or trilobed (as in Fig. 8c). Setiger 4 with 1, rarely 2, acicular seta. Tube semitransparent, ringed .... *Spiochaetopterus*

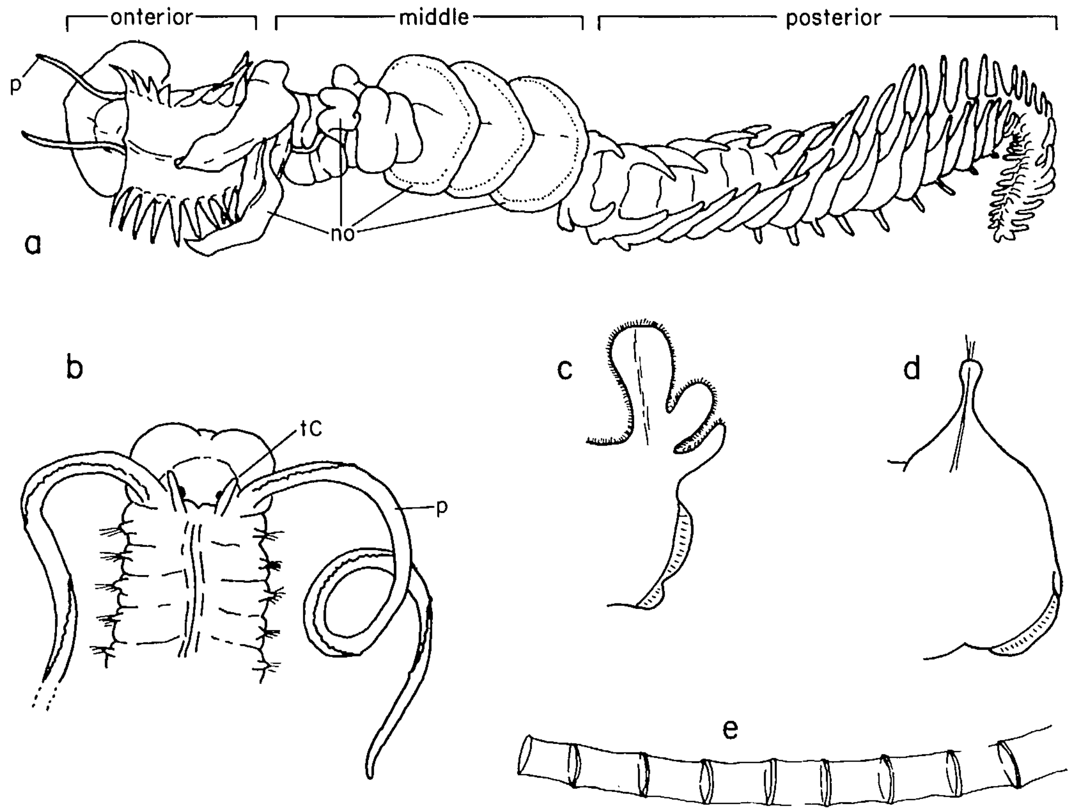


FIG. 8. CHAETOPTERIDAE: *Chaetopterus variopedatus*: a, entire worm, dorsal view. *Phyllochaetopterus prolifica*: b, anterior end, dorsal view. *Spiochaetopterus costarum*: c, middle parapodium; d, posterior parapodium; e, part of tube. Sources: a, Ushakov (1955); b–d, CPF; e, Fauvel (1927) [a–d, modified].

Chaetopterus Cuvier

Setiger 4 with 10–20 dark acicular setae. Notopodia of middle body region winglike on segment 1; cuplike on segment 2, and paddlelike on segments 3–5 (Fig. 8a). Tube parchmentlike, U-shaped .... *C. variopedatus* (Renier)

(See HARTMAN 1969)

This cosmopolitan species, known previously from Oregon (HARTMAN AND REISH 1950), is herein recorded from British Columbia: specimens were collected subtidally, west of Promise Island, off Wright Sound, 53°22.5′N, 129°15.7′W, Aug. 14, 1974, by A. Parkinson (identified by K. D. Hobson) and at Point Elizabeth, June 1974, by P. Lambert and G. Green (identified by P. Lambert, British Columbia Provincial Museum, Victoria, B.C., V8V 1X4).

Mesochaetopterus Potts

Middle region with 3 long, flat, dorsally glandular segments; last 2 segments each with cuplike structure formed by enlarged dorsal ciliated groove (as in Table 2, fig. C) .... *M. taylori* Potts

Phyllochaetopterus Grube

Listed species have tubes that are semitransparent and irregularly ringed anteriorly, becoming more opaque and less distinctly ringed posteriorly. The acicular setae on setiger 4 and the outline of the middle and posterior setigers resemble those of *Spiochaetopterus costarum* (see Fig. 8c, d).

1 Middle region with 2 segments. Tube straight, about 1–5 mm wide .... *P. claparedii* McIntosh
(See Berkeley and Berkeley 1962; Dales 1961)

Middle region with 4–13 segments. Tube branched, sinuous, about 1.0–1.5 mm wide. (See also Fig. 8b) .... *P. prolifica* Potts

Spiochaetopterus Sars

Telepsavus Costa and *Leptochaetopterus* Berkeley are included in this genus (see Gitay 1969).

Middle region with 20–90 segments. Tube straight, regularly ringed (Fig. 8e). (See also Fig. 8c, d) .... *S. costarum* (Claparède)
(*Telepsavus costarum* in CPF)

CIRRATULIDAE

Table 2, fig. D; Fig. 9
Day (1967); Hartman (1969)

1 Anterior end without appendages. Neuropodia with comblike seta (as in Fig. 9i) .... *Raricirrus*†

Anterior end with appendages (as in Table 2, fig. D; Fig. 9g). Neuropodia with capillaries (as in Fig. 9j), limbate setae, acicular setae (as in Fig. 9b, c), or acicular hooks (as in Fig. 9h) 2

2 With 1 pair of heavy palps (as in Table 2, fig. D [leave scars when lost]) 3

With 1 or several pairs of patches of palps (as in Fig. 9g [if 1 pair, patches may almost coalesce to dorsal band]) 6

3 With gills on segment with palps and next 2–10 setigers. Median parapodia with distally excavate hooks (as in Fig. 9h) .... *Dodecaceria*

With gills on many setigers. Without distally excavate hooks 4

4 With limbate or capillary setae only (as in Fig. 9d, j, k) .... *Tharyx*

With capillary setae and, in some [at least posterior] setigers, acicular setae (as in Fig. 9b, c) 5

5 Acicular setae distally bifid (as in Fig. 9a, b) or serrated .... *Caulleriella*

Acicular setae distally entire (as in Fig. 9c) .... *Chaetozone*

6 Several segments after setiger 1 with patches of palps .... *Timarete*†

Only one segment with patches of palps 7

7 Patches of palps apparently on setiger 1 .... *Cirratulus*

Patches of palps apparently on a segment after setiger 1 [may be setiger 4, 5, 6, or 7] .... *Cirriformia**

Caulleriella Chamberlin

(As emended in Hartman 1961)

1 With acicular setae from neuropodium 1 and from about notopodium 20; with delicate wings (Fig. 9a). Neuropodia [at least anteriorly] also with capillary setae .... *C. alata* (Southern)

(See Hartman 1969)

In Puget Sound material identified as *C. alata?* (Banse and Hobson 1968), notopodial acicular setae start from setiger 45–55.

With acicular setae from median [e.g., 17] neuropodia and posterior notopodia; convex margin of distal end smooth [not serrated] (Fig. 9b). Posterior neuropodia without capillary setae .... *C. hamata* (Hartman)*

(See Hartman 1969)

Chaetozone Malmgren

(As emended in Hartman 1961)

1 Capillary setae of 2 kinds (Fig. 9f), except in first approximately 12 setigers: very long, threadlike (slightly twisted) and much shorter .... *C. spinosa* Moore

(See Hartman 1969)

The record for Washington by Banse and Hobson (1968), based on an anterior end without acicular setae, needs to be confirmed.

Capillary setae of about same form [low magnification] 2

2 With neuropodial acicular setae (Fig. 9c) from setigers 18–34. Capillary setae in middle of body obliquely truncate near tips (Fig. 9d). Acicular setae not nearly encircling body posteriorly .... *C. acuta* Banse and Hobson

(See Banse and Hobson 1968)

With neuropodial acicular setae from setigers 40–70. All capillary setae smoothly limbate. Acicular setae nearly encircling body posteriorly (Fig. 9e) [capillary setae absent] .... *C. setosa* Malmgren

Cirratulus Lamarck

The listed species lack near-globular eyes on the gills. The palps are originally presegmental and move during the ontogeny to the adult position. Therefore, juveniles of *Cirriformia* spp. may key out as *Cirratulus* spp.

1 With neuropodial acicular setae from setiger 6–12. (See also Fig. 9g) .... *C. cirratus* (Müller)

(In CPF, see also HARTMAN 1961)

Caulleriella gracilis in CPF was placed by BANSE AND HOBSON (1968) in synonymy with their newly described *Chaetozone berkeleyorum*. Subsequently, the latter species was found to be synonymous with *C. cirratus* (P. Jumars, Department of Oceanography, University of Washington, Seattle, WA 98195, personal communication).

With neuropodial acicular setae from setiger 17 to 39 .... *C. spectabilis* (Kinberg)

In CPF, *C. cingulatus* Johnson and *C. robustus* Johnson were regarded as synonyms of *C. spectabilis*. In contrast, HARTMAN (1961, 1969) recognized *C. cingulatus* and *C. spectabilis* (syn., *C. robustus*) as subspecies of *C. cirratus*. Among 12 specimens in the British Columbia Provincial Museum from various sites in British Columbia, however, the diagnostic characters used by JOHNSON (1901: achaetous region with 7 or 3 rings; setigers of median body three- or one-ringed; and neuropodial acicular setae from [about] setiger 30 or from 19 to 20, respectively), occur in various combinations, with intergrading in the first occurrence of the acicular setae, so that the synonomies seem uncertain. Therefore, we follow CPF.

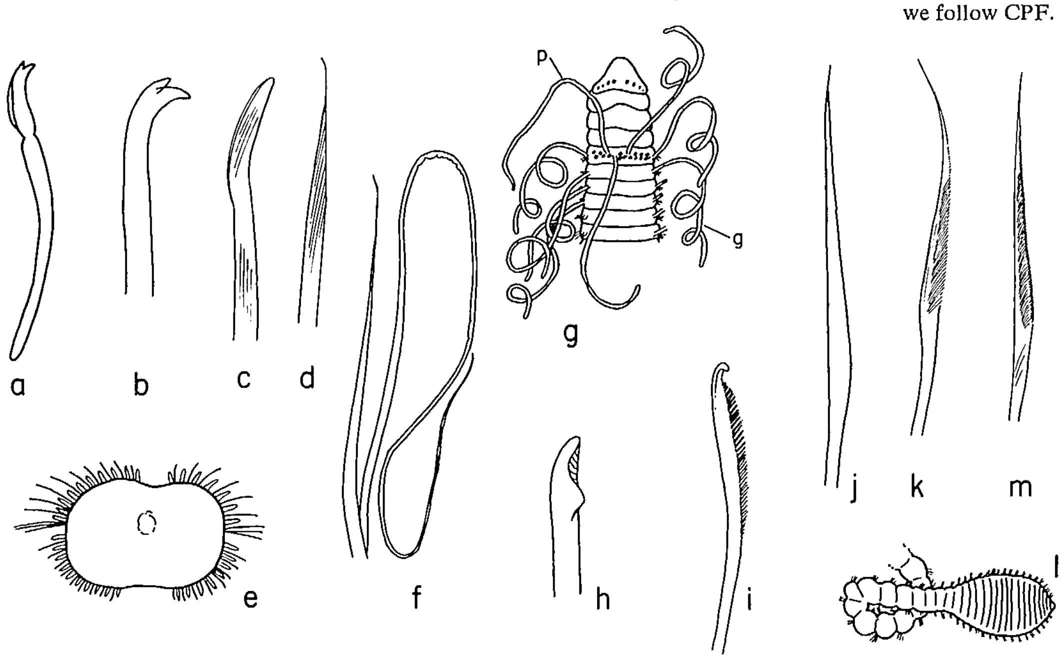


FIG. 9. CIRRATULIDAE: *Caulleriella alata*: a, acicular seta. *C. hamata**: b, acicular seta. *Chaetozone acuta*: c, acicular seta; d, capillary seta from median section of body. *Ch. setosa*: e, cross section of posterior segment [schematic]. *Ch. spinosa*: f, ordinary and threadlike capillary setae. *Cirratulus cirratus*: g, anterior end, dorsal view [most palps lost]. *Dodecaceria concharum*: h, excavate hook. *Raricirrus maculata* Hartman†: i, comblike seta. *Tharyx multifilis*: j, capillary seta. *T. secundus*: k, capillary seta, *l*, posterior end. *T. serratisetis*: m, capillary seta. Sources: a, Southern (1914); b, Hartman (1948); c, d, k, m, Banse and Hobson (1968); e, Malmgren (1867); f, Moore (1903); g, Ushakov (1955); h, Fauvel (1927); i, Hartman (1961); j, *l*, original [b, e, i, modified].

Cirriformia Hartman*

See note under *Cirratulus* (p. 52).

Neuropodial acicular setae pointed [similar to Fig. 9c], yellow [not dark or black], from about setiger 40 [not 25]; capillary setae absent on posterior segments [after segment 150] .... *C. spirabranchia* (Moore)*
(See HARTMAN 1969, BLAKE 1975 [remarks on bifid acicular setae in juveniles]; HARTMAN AND REISH 1950)

Dodecaceria Oersted

1 With gills on 2 or 3 setigers. Bore in calcareous material. (See also Fig. 9h) .... *D. concharum* Oersted

With gills on 5–10 setigers. Build calcareous tubes .... *D. fewkesi* Berkeley and Berkeley
(*D. pacifica* [Fewkes] in CPF, see BERKELEY AND BERKELEY 1954)

Tharyx Webster and Benedict

The species cannot be identified from anterior ends. In listed species, notosetae are longer than the neurosetae; the anus is dorsal; tubes are without numerous lateral extensions.

1 Prostomium with eyes. Posterior body inflated (as in Fig. 9*l*) or not inflated. Posterior neurosetae [may be after setiger 100] broad, with serrated or coarse cutting edge [visible at 400x] (as in Fig. 9k, m) 2

Prostomium without eyes. Posterior body not clearly inflated. Posterior neurosetae narrow or broad-limbate, without coarse or serrated cutting edge [at 400x] (as in Fig. 9j) 3

2 Middle segments of body beadlike, posterior body inflated (Fig. 9*l*). Serrated neurosetae from setiger 30–40 (Fig. 9k) .... *T. secundus* Banse and Hobson
(See BANSE AND HOBSON 1968)

Middle segments of body smooth, posterior body not inflated. Posterior neurosetae with coarse cutting edge from about setiger 100 (Fig. 9m) .... *T. serratisetis* Banse and Hobson
(See BANSE AND HOBSON 1968)

3 Body small, up to 1.5 cm long. Estuarine and intertidal .... *T. parvus* Berkeley
(See HARTMAN 1961; *T. multifilis parvus* in CPF)

Body up to 6 cm long. Subtidal (see also Fig. 9j) .... *T. multifilis* Moore
(In CPF, see also HARTMAN 1961, BANSE AND HOBSON 1968)

ACROCIRRIDAE

Table 2, fig. E; Fig. 10
BANSE (1969)

The first gill-bearing segment is segment 2.

1 Body a few centimeters long, with more than 55 segments. Epidermis smooth or minutely papillated. Palps adjacent .... *Acrocirrus*

Body less than 1.5 cm, usually with fewer than 55 segments. Epidermis densely covered with papillae. Palps separated by at least own width (as in Table 2, fig. E) .... *Macrochaeta*

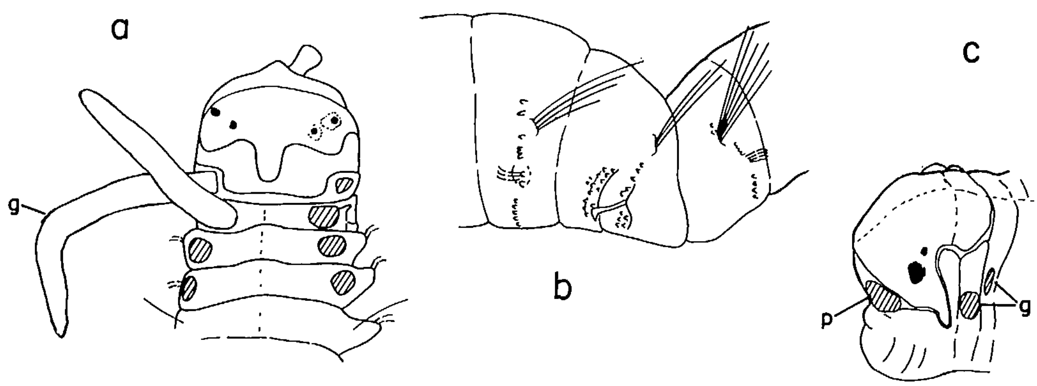


FIG. 10. ACROCIRRIDAE: *Acrocirrus columbianus*: a, anterior end, dorsal view [most appendages lost]. *A. heterochaetus**: b, setigers 10–12, lateral view. *A. occipitalis*: c, anterior end, lateral view [appendages lost; the broken line indicates the imaginary middorsal line]. Sources: a, c, Banse (1979a); b, Banse (1969) [a, modified; c is the original drawing for fig. 1d in Banse (1979a) which was incompletely reproduced].

Acrocirrus Grube

1 All but setiger 11 with compound neurosetae. Neuropodium of setiger 11 with conspicuous hook (Fig. 10b) .... *A. heterochaetus* Annenkova*
(See BANSE 1969)

All setigers with compound neurosetae [one or two per parapodium] 2

2 Prostomium extending into segment 1 (Fig. 10a). Neurosetae from segment 4, notosetae from segment 6 .... *A. columbianus* Banse
(See BANSE 1979a)

Prostomium extending through segment 2 (Fig. 10c) .... *A. occipitalis* Banse
(See BANSE 1979a)

Macrochaeta Grube

Segment 1 dorsally not visible [first gill-bearing segment follows prostomium] (as in Table 2, fig. E) .... *M. pege* Banse
(See Banse 1969)

COSSURIDAE

Table 2, fig. F
Day (1967); Fauchald (1972)

Body not divided into 2 regions; all setae limbate .... *Cossura*

Cossura Webster and Benedict

1 With 1 or 2 anterior achaetous rings. More than 1 anterior setiger uniramous .... *C. longocirrata* Webster and Benedict*
(See Webster and Benedict 1887; Carey 1972)
At least three species have been described under this name (see Laubier 1964; Fauchald 1972).

With 2 anterior achaetous rings (as in Table 2, fig. F). Only setiger 1 uniramous 2

2 Tentacle inserted on posterior part of setiger 2. With 3 unbranched pygidial cirri .... *C. soyeri* Laubier
(See Laubier 1964; Banse 1981)

Tentacle inserted between setigers 3 and 4. Pygidium unknown .... *Cossura* sp.
(See Banse 1981)

CTENODRILIDAE

Table 2, fig. G
Fauchald (1977); Wilfert (1973)

This family was not recognized in CPF; *Ctenodrilus* was included in the Cirratulidae.

Body short, with up to 15 segments. Without cirri or gills (as in Table 2, fig. G) .... *Ctenodrilus*

Ctenodrilus Claparède

Setae serrated usually on only one side .... *C. serratus* (Schmidt)

FLABELLIGERIDAE

Table 3, fig. A; Fig. 11

DAY (1967); HARTMAN (1969); LIGHT (1978b); STØP-BOWITZ (1948)

Long, anteriorly directed capillary setae of the first few setigers may form a cephalic cage (as in Fig. 11f, k). The grooved palps and the gill filaments (see Fig. 11h, j) are usually retracted and can then be observed only by dissection. To determine the shape and arrangement of the dermal papillae, first remove some of the sediment from the body surface. Middle neuropodia should be studied for the diagnostic setae.

1 Worm usually encased in mucoid sheath with imbedded long papillae [ends inflated], particularly around parapodia. Epithelium smooth, or nearly so. With cephalic cage. Neuropodia with only hooks [pseudocompound or compound (as in Fig. 11e)] .... *Flabelligera*

Worm not encased in mucoid sheath, usually covered with sand or silt. Epithelium usually densely papillose. With or without cephalic cage. Neuropodia with capillaries or hooks [simple, pseudocompound, or compound] 2

2 Notopodia with long papillae with inflated and balloonlike ends (as in Fig. 11d). Neuropodia with only [pseudocompound] hooks .... *Flabelliderma*†

Notopodia without balloonlike papillae. Neuropodia with capillaries or hooks [simple (as in Fig. 11i, *l*) or pseudocompound] 3

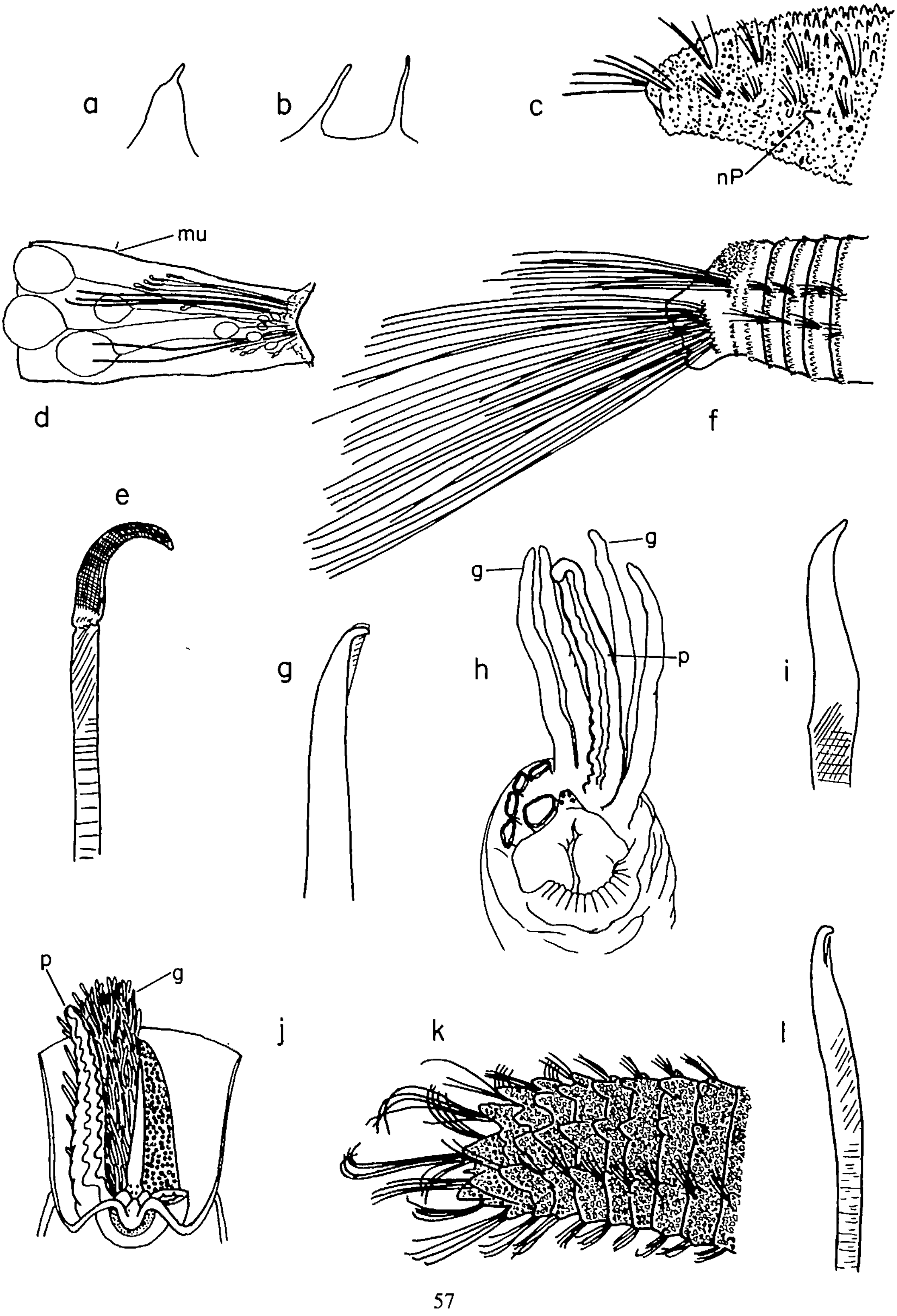
3 Body cylindrical, usually short, stout [maggotlike]. Setiger 4 or 5 with ventrolateral pair of nephridial papillae (as in Fig. 11c). Cephalic cage absent or poorly developed (as in Fig. 11c). Neuropodia with capillaries .... *Brada*

Body cylindrical, usually elongate (as in Table 2, fig. H). Setigers 4 or 5 without paired nephridial papillae [except in some species of *Diplocirrus*†]. Cephalic cage well developed [most species] (as in Fig. 11f, k) 4

4 Neuropodia with capillaries. With 2 kinds of gills: stout [outer] and slender [inner] .... *Diplocirrus*†

Neuropodia with simple hooks (as in Fig. 11i, *l*). With 1 kind of gill (as in Fig. 11h, j) 5

FIG. 11. FLABELLIGERIDAE: *Brada sachalina*: a, dermal papilla. *B. villosa*: b, dermal papillae; c, anterior end, lateral view. *Flabelliderma essenbergae* (Hartman)†: d, notopodium. *Flabelligera affinis*: e, compound hook. *Pherusa inflata**: f, anterior end, lateral view. *P. negligens*: g, tip of median hooded hook. *P. plumosa*: h, anterior end [dissected], anterioventral view; i, tip of simple unidentate hook. *Piromis arenosus* Kinberg†: j, anterior end [dissected], ventral view. *P. eruca*: k, anterior end, dorsal view; *l*, posterior simple bidentate hook. Sources: a, b, Ushakov (1955); c, Støp-Bowitz (1948); d, h, Hartman (1961); e, *l*, CPF; f, Hartman (1952); g, Hobson (1974); i, Banse et al. (1968); j, Day (1967); k, original [b–d, f, h, j, modified].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5 With several [8] to many gills arising from semicircular hood (as in Fig. 11h). Listed species with unidentate neurosetae (as in Fig. 11i) .... *Pherusa*

With many gills arising from tonguelike projection (as in Fig. 11j). Listed species with bidentate neurosetae (as in Fig. 11*l*) .... *Piromis*

Brada Stimpson

The listed species have 12–35 setigers, 2–5 notosetae per notopodium, and a papillose body covered with sand or silt.

1 Dorsum of middle segments with 2 or 3 transverse rows of broad, domelike papillae, each with filiform tip (Fig. 11a) .... *B. sachalina* Annenkova
(See Ushakov 1955; Banse and Hobson 1968)
Flabelligera essenbergae tenebricosa Berkeley, 1966, from British Columbia was referred to *B. sachalina* (Hobson 1977).

Dorsum of middle segments with 3–12 transverse rows of long, slender papillae (Fig. 11b). (See also Fig. 11c) .... *B. villosa* (Rathke)

Flabelligera Sars

Entire body covered with long papillae imbedded in mucus. Neuropodia with 1 or 2 neurosetae; hooks curved, with rounded tip (Fig. 11e) [not straight with flagelliform appendage] .... *F. affinis* Sars
(*F. infundibularis* Johnson in CPF, see Pettibone 1954)

Pherusa Oken

In the listed species, the hooks begin on setiger 4.

1 With hooded hooks (Fig. 11g) .... *P. negligens* (Berkeley and Berkeley)
(*Stylarioides negligens* in CPF, see also Hobson 1974)

Without hooded hooks (as in Fig. 11i) 2

2 Anterior end plaque shaped (Fig. 11f). With single row of papillae encircling each segment .. .. *P. inflata* (Treadwell)*
(See Hartman 1969)

Anterior end rounded. With several irregular rows of papillae on each segment. (See also Fig. 11h, i) .... *P. plumosa* (Müller)
(*Stylarioides papillata* (Johnson) and *S. plumosa* in CPF, see Pettibone 1956)
Specimens identified as *P. neopapillata* [not Hartman] by Banse et al. (1968) are referred herein to *P. plumosa.*

Piromis Kinberg

With bidendate hooks (Fig. 11*l*) from setiger 2–4 [usually 4] to posterior end. Anterior dorsum with 2 longitudinal rows of large conical papillae (Fig. 11k). Body covered with sandy crust .... *P. eruca* (Claparède)

(*Stylarioides arenosa* (Webster) in CPF, see DAY 1973 [under *P. eruca websteri* Day])

Two subspecies, *P. eruca eruca* (Claparède) and *P. eruca websteri* Day, were recognized by DAY (1973) for North Atlantic material. The characters above refer to specimens from British Columbia (USNM 40473) which are closer to the former than to the latter, by virtue of the first occurrence of neurosetae.

SCALIBREGMIDAE

Table 3, fig. C; Fig. 12
KUDENOV AND BLAKE (1978)

Spines [acicular setae], when present, occur in the first few notopodia.

1 With branched gills on some anterior segments (as in Fig. 12c). Without acicular spines. Median and posterior segments with well-developed dorsal and ventral cirri (as in Fig. 12d) .... *Scalibregma*

Without gills. With or without spines. Without dorsal or ventral cirri [*Asclerocheilus californicus*† has long fingerlike pre- and post setal lobes] 2

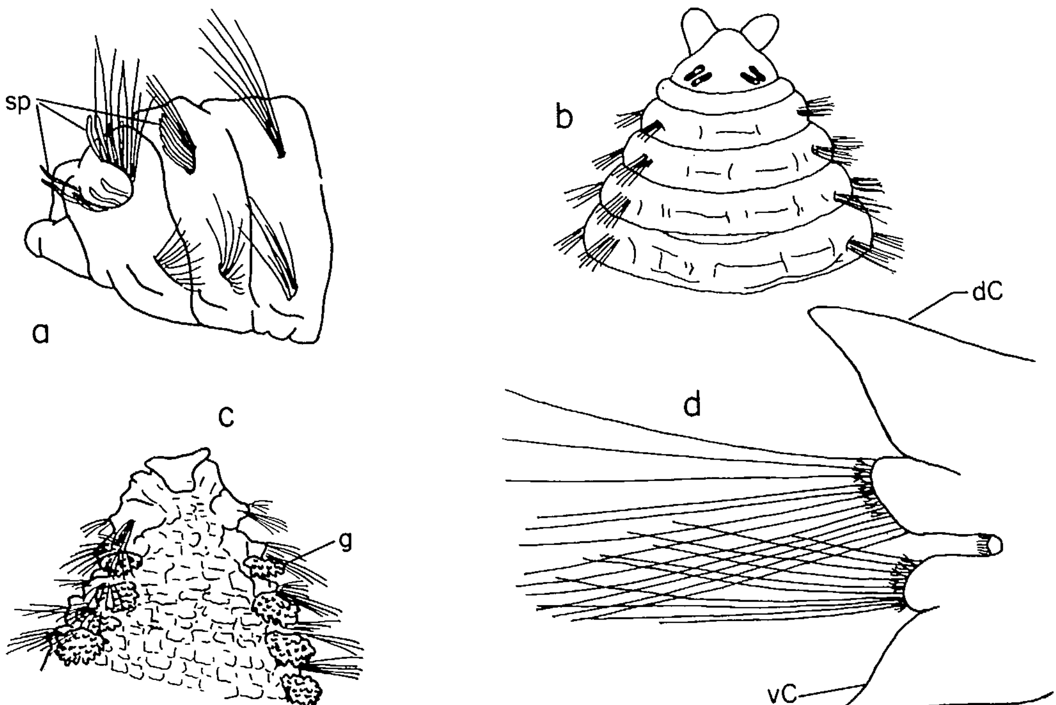


FIG. 12. SCALIBREGMIDAE: *Asclerocheilus beringianus*: a, anterior end, lateral view. *Hyboscolex pacificus*: b, anterior end, dorsal view. *Scalibregma inflatum*: c, anterior end, dorsal view; d, posterior parapodium, anterior view. Sources: a, c, d, original; b, Ushakov (1955).

2 With spines in first 1–2 or 3 setigers (as in Fig. 12a) .... *Asclerocheilus*

Without acicular spines .... *Hyboscolex*

Asclerocheilus Ashworth

First 2 notopodia with spines, 2 rows in setiger 1, 1 row in setiger 2; remaining notopodia without spines (Fig. 12a). Parapodial lobes broad and low [not long, fingerlike] .... *A. beringianus* Ushakov

(See Ushakov 1955; Hobson 1974)

Hyboscolex Schmarda

Prostomium with 2 anterolateral projections; posteriorly with 2 lateral rows of brownish eyespots on each side (Fig. 12b). With or without 4–6 blunt anal cirri .... *H. pacificus* (Moore)

(*Oncoscolex pacificus* in CPF, see also Kudenov and Blake 1978)

Scalibregma Rathke

Prostomium with 2 anterolateral projections (Fig. 12c). Tips of dorsal and ventral cirri acute [not broad, rounded] in posterior parapodia (Fig. 12d). With 4 or 5 filiform anal cirri .... *S. inflatum* Rathke

OPHELIIDAE

Table 3, fig. D, E; Fig. 13

1 Body stout, without ventral groove (as in Table 3, fig. E). With lateral gills .... *Travisia*

Body relatively slender, with ventral groove [at least in posterior region] (as in Table 3, fig. D). With or without gills 2

2 Without lateral gills. With ventral groove throughout .... *Polyophthalmus*†

With lateral gills (as in Fig. 13b, e) 3

3 With ventral groove throughout 4

With ventral groove only in posterior region (as in Fig. 13e) 5

4 With lateral eyespots (as in Fig. 13b [may fade in preservative]) .... *Armandia*

Without lateral eyespots .... *Ophelina*

5 Gills branched (as in Fig. 13c, d). Setiger 10 with heavy lateral ridge .... *Euzonus*

Gills unbranched (as in Fig. 13b [North Pacific species]). Setiger 10 without lateral ridge .... *Ophelia*

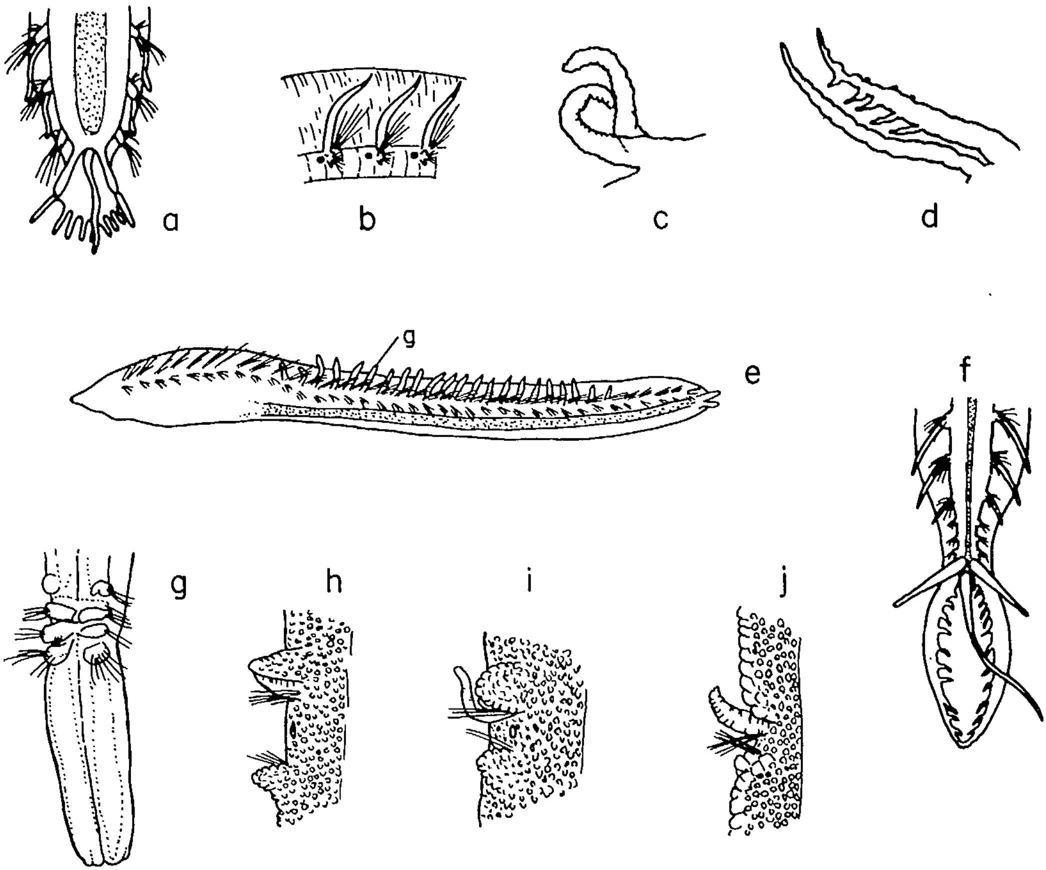


FIG. 13. OPHELIIDAE [the ventral groove is stippled]: *Armandia brevis*: a, posterior end, ventral view; b, median setigers, lateral view. *Euzonus mucronata*: c, gill. *E. williamsi*: d, gill. *Ophelia limacina*: e, entire worm, ventrolateral view. *Ophelina acuminata*: f, posterior end, ventral view. *O. breviata*: g, posterior end, ventral view. *Travisia brevis*: h, setiger 20, lateral view. *T. forbesii*: i, setiger 20, lateral view. *T. pupa*: j, setiger 20, lateral view. Sources: a, b, f, CPF; c, Treadwell (1914); d, Hartman (1938a); e, Støp-Bowitz (1945); g, Ehlers (1913); h–j, original [a–c, e–g, modified].

Armandia Filippi

Pygidium with short flap overhanging and nearly surrounding anus, with 4–7 small cirri on end, 1 larger on each side, and 1 long cirrus arising ventrally (Fig. 13a [cirri often lost]). Prostomium with 2 or 3 subdermal eyespots. With 29 or 30 setigers. (See also Fig. 13b) .... *A. brevis* (Moore)

(In CPF, see also BANSE ET AL. 1968)

Euzonus Grube

Thoracophelia Ehlers and *Pectinophelia* Hartman are included in this genus. The listed species have 16–19 pairs of gills.

1 Gills with 2 branches, not pectinate (Fig. 13c) .... *E. mucronata* (Treadwell)
(*Thoracophelia mucronata* in CPF)

Gills with 2 [rarely 3] main branches, irregularly [not neatly] pectinate (Fig. 13d) .... *E. williamsi* (Hartman)
(See HARTMAN 1969; HOBSON 1974)

Ophelia Savigny

With 33–40 setigers: 10 prebranchial, 16–24 branchial, and 4–7 [difficult to recognize] postbranchial (Fig. 13e) .... *O. limacina* (Rathke)
(*O. borealis* Quatrefages in BERKELEY AND BERKELEY 1954, see PETTIBONE 1956)

Ophelina Oersted

The listed species have gills in the median body region.

1 Pygidium spoonlike, with ventral opening, fringed with small papillae and with 3 large subequal cirri at base (Fig. 13f [median cirrus often lost]). With 42–50 setigers .... *O. acuminata* Oersted
(*Ammotrypane aulogaster* Rathke in CPF)

Pygidium tubelike, with terminal opening and several indistinct lobes (Fig. 13g) or short subequal papillae at end. With 24–28 [33] setigers .... *O. breviata* (Ehlers)
(See *Ammotrypane breviata* in HOBSON 1977)

Travisia Johnston

1 Posterior region without enlarged parapodial lobes (Fig. 13j). Beading on surface small on anterior part of segmental ring, warty and much larger on posterior part (Fig. 13j). With 24–25 [rarely 21–23] pairs of gills .... *T. pupa* Moore
(In CPF; *T. carnea* [not Verrill] in BERKELEY 1966, see also HOBSON 1977)

Posterior region with enlarged parapodial lobes (as in Fig. 13h, i). Beading on surface small, uniform in size (as in Fig. 13h, i). Number of gills variable 2

2 Body 4–7 cm long, with 26–35 pairs of gills and 33–40 setigers .... *T. japonica* Fujiwara
(See USHAKOV 1955; ?*T. gigas* Hartman† in BERKELEY 1966, see also HOBSON 1977)

Body 1–3 cm long, with 18–23 pairs of gills and 23–26 setigers 3

3 Enlarged parapodial lobes tapering (Fig. 13h) .... *T. brevis* Moore

Enlarged parapodial lobes rounded (Fig. 13i) .... *T. forbesii* Johnston
(See Fauvel 1927; Pettibone 1956)

STERNASPIDAE

Table 3, fig. F

One recognized genus in family .... *Sternaspis*

Sternaspis Otto

Body oval or dumbbell shaped. (See also Table 3, fig. F) ....
.... *S. scutata* (Renier)
(*S. fossor* Stimpson in CPF, see Pettibone 1954)

CAPITELLIDAE

Table 3, fig. G; Fig. 14
Fauchald (1977); Hartman (1947)

The boundary between thorax and abdomen is usually marked by the shape of the segments, the texture of the epidermis [rugose or areolated in thorax, smooth in abdomen], and the position of the setal bundles [in pockets in thorax, on papillae in abdomen] (as in Table 3, fig. G). The first occurrence of hooded hooks may coincide with the boundary between the thorax and abdomen or may be anterior [or rarely posterior] to this boundary. Gills are retractable or nonretractable, epidermal modifications of or near the abdominal noto- and/or neuropodia (as in Fig. 14b, h). Examine especially posterior-most segments when determining the presence of gills.

1 First apparent segment with setae (as in Fig. 14a). Male with genital hooks dorsally on setiger 8 and 9 (as in Fig. 14a). Female with or without genital hooks .... *Capitella*

First apparent segment without setae (as in Table 3, fig. G). Both sexes without genital hooks 2

2 First 4–6 setigers with capillary notosetae 3

First 10–18 setigers with capillary notosetae 5

3 With 9–10 thoracic setigers. Setigers 1–4 with capillary setae only. Posterior abdominal segments with or without capillary notosetae .... *Mediomastus*

With 11 thoracic setigers. Setigers 1–5 or 6 with capillary setae only. Posterior abdominal segments without capillary notosetae 4

4 Setigers 1–5 with capillary setae; setigers 6–11 with hooded hooks only .... *Heteromastus*

Setigers 1–6 with capillary setae only, setigers 7–11 with hooded hooks only; or setigers 6–8 with variable distribution of capillary setae and hooded hooks, setigers 9–11 with hooded hooks only .... *Barantolla*

5 With [16] 17–18 thoracic setigers, all with capillary setae, followed by one setiger with capillaries and hooded hooks .... *Anotomastus*†

With 10–13 thoracic setigers, all with capillary setae. First abdominal setiger with only hooded hooks in both rows 6

6 With 10–11 thoracic setigers 7

With 12–13 thoracic setigers 8

7 With 10 thoracic setigers .... *Decamastus*

With 11 thoracic setigers .... *Notomastus*

8 With 12 thoracic setigers .... *Leiochrides*†

With 13 thoracic setigers .... *Dasybranchus*†

Barantolla Southern

Without gills. Distribution of hooded hooks and capillary setae in setigers 6–8 highly variable .... *B. americana* Hartman

(See Hartman 1969, Hobson 1974)

Capitella Blainville

1 First 4–7 setigers with capillary setae only. Male with 3–5 pairs of genital hooks dorsally on setigers 8 and 1–3 pairs on segment 9 (Fig. 14a). Female with hooded hooks in setigers 8 and 9; usually without genital hooks .... *C. capitata* (Fabricius)

See Hartman (1969) for diagnostic characters of 4 subspecies and Reish (1977) for experimental work on *C. capitata* from southern California. Six sibling species have been found in material from Massachusetts. They are very difficult to distinguish morphologically from *C. capitata* but show markedly different patterns of reproduction and life history; up to 5 occur in the same sample (Grassle and Grassle 1976).

First 7 setigers with capillary setae only. Notopodia of setigers 8 and 9 without any setae .... *C. dizonata* Johnson

(Questionable species, see Hartman 1947)

Decamastus Hartman

Setiger 1 with notosetae and neurosetae. At about abdominal segment 8, notopodia nearly middorsal, each with only 9–13 notosetae, neuropodia

nearly reaching midventral line, each with about 40–55 neurosetae .... *D. gracilis* Hartman
(See HARTMAN 1969, HOBSON 1974)

Heteromastus Eisig

1 Gills conspicuous, beginning from abdominal segment 15–30 as simple filaments, gradually increasing in number and length posteriorly (Fig. 14b) .... *H. filobranchus* Berkeley and Berkeley

Gills inconspicuous, beginning on about abdominal segment 70 as simple extensions of parapodial lobes .... *H. filiformis* (Claparède)
(See FAUVEL 1927; BERKELEY 1966)

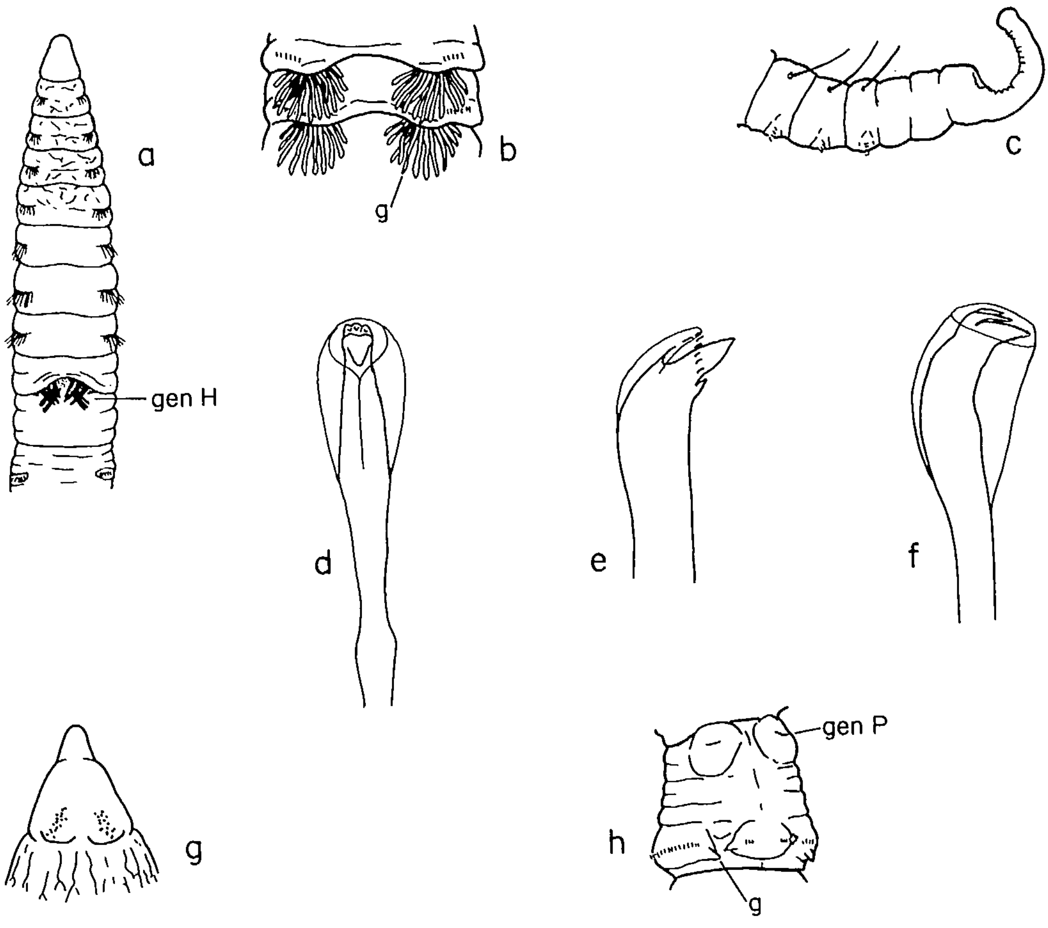


FIG. 14. CAPITELLIDAE: *Capitella capitata*: a, anterior end of male, dorsal view. *Heteromastus filobranchus*: b, abdominal segments, dorsal view. *Mediomastus ambiseta*: c, posterior end, lateral view; d, hooded hook, frontal view. *Notomastus giganteus*: e, distal part of hook with reduced hood, lateral view. *N. tenuis*: f, hooded hook, lateral view; g, prostomium, dorsal view. *Notomastus* sp.: h, abdominal segment 3, dorsolateral view. Sources: a, CPF; b, Berkeley and Berkeley (1932a); c, d, f, g, Hartman (1947); e, Moore (1906b); h, original [a–g, modified].

Mediomastus Hartman

Capitita Hartman is included in this genus (see Hartmann-Schröder 1962). The listed species lack gills and do not have an acutely prolonged prostomium.

1 Hooded hooks with more than 3 teeth above main tooth. Posterior notopodia without capillary setae .... *M. capensis* Day
(See Hobson 1974)

Hooded hooks with 3 teeth above main tooth (as in Fig. 14d) 2

2 Posterior [after about segment 30] notopodia with 1 or 2 capillary setae (Fig. 14c). (See also Fig. 14d) .... *M. ambiseta* (Hartman)
(See *Capitita ambiseta* in Hartman 1969)
This species is herein newly recorded from three subtidal stations, mud bottom, near Orcas Island, Washington, collected by H. L. Sanders, and identified by K. D. Hobson.

Posterior notopodia without capillary setae .... *M. californiensis* Hartman*
(See Hartman 1969; Hartman and Reish 1950)

Notomastus Sars

In sexually mature individuals of the listed species, genital pores (as in Fig. 14h, from an unidentified species), if present, may be very conspicuous but are restricted to posterior thoracic [not abdominal] segments.

1 Abdominal hooks with reduced hood (Fig. 14e); gills long, inconspicuous folds [not bushy, retractile tufts] .... *N. giganteus* Moore

Abdominal hooks hooded (as in Fig. 14f) 2

2 First setiger with notosetae and neurosetae. Gills formed by inflated superior edge of abdominal neuropodium (as in Fig. 14h). Prostomium with eyespots .... *N. lineatus* Claparède

First setiger with notosetae only. Without distinct gills 3

3 Prostomium with pair of oval patches of many reddish eyespots (Fig. 14g [may fade in preservative]). Setigers 7–10 not noticeably lighter in color than rest of thorax. (See also Fig. 14f) .... *N. tenuis* Moore
(In CPF; *N. lineatus balanoglossi* [not Eisig] in Berkeley and Berkeley 1962, see Hobson 1977)

Without eyespots. Setigers 7–10 light [almost white] in color and opaque .... *N. variegatus* Berkeley and Berkeley

PARERGODRILIDAE

Table 3, fig. H
KARLING (1958); REISINGER (1960)

Body with 10–11 setigers. With 3 kinds of setae: (1) limbate with long hairlike tip [only on setiger 1]; (2) limbate with hairlike tip; and (3) forked (as in Table 3, fig. H) .... *Stygocapitella*

Stygocapitella Knöllner

One recognized species in genus .... *S. subterranea* Knöllner
(See KARLING 1958; HOBSON 1974)

ARENICOLIDAE

Table 4, fig. A; Fig. 15
WELLS (1959)

To examine the oesophageal caeca (see Fig. 15b) make a dorsal longitudinal incision from setiger 4 to 8.

1 Worms shorter than 2.5 cm, translucent. Gills simple or with few branches (as in Fig. 15e), not beginning before setiger 18 [absent in juveniles]. Without posterior achaetous portion .... *Branchiomaldane*

Worms longer than 2.5 cm, opaque. Gills with many branches (as in Fig. 15d), beginning on setiger 7 or 8. With posterior achaetous portion (as in Table 4, fig. A) 2

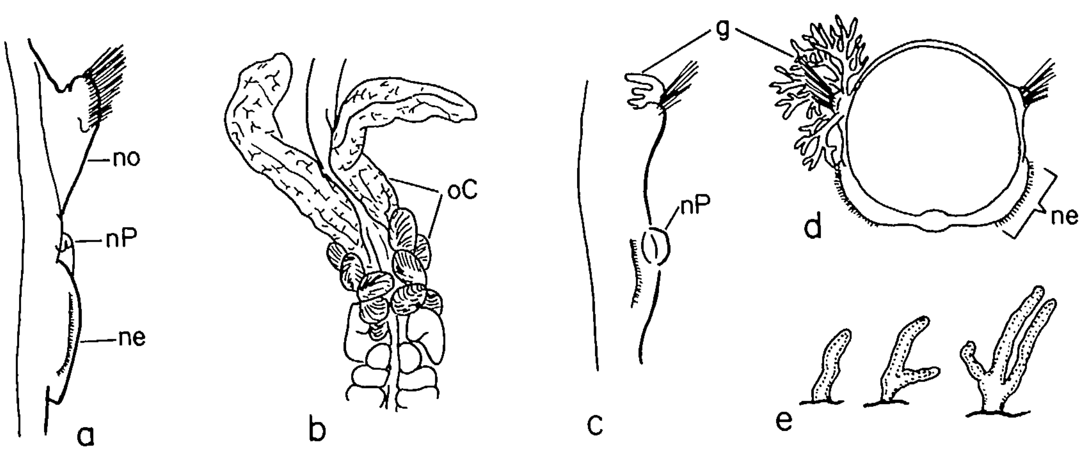


FIG. 15. ARENICOLIDAE: *Abarenicola claparedi oceanica*: a, parapodium 7, left lateral view. *A. pacifica*: b, part of gut, dorsal view [setigers 4 to 8]; c, parapodium 7, left lateral view; d, setiger 16, cross section [right gill omitted]. *Branchiomaldane vincenti*: e, gills. Sources: a–d, original; e, Berkeley and Berkeley (1932a).

2 With one pair of long oesophageal caeca and several pairs of smaller accessory oesophageal caeca (as in Fig. 15b). Neuropodia of posterior gill-bearing segments not closely approaching midventral line (see Fig. 15d) ...... *Abarenicola*

With one pair of [short] oesophageal caeca, without accessory oesophageal caeca. Neuropodia of posterior gill-bearing segments closely approaching midventral line .... *Arenicola*

Abarenicola Wells

In the listed species, nephridial papillae are situated immediately posterior to the neuropodium on setigers 5–9.

1 Nephridial papilla without ventral flap (Fig. 15c). With 3–6 pairs of accessory oesophageal caeca (Fig. 15b). (See also Fig. 15d) .... *A. pacifica* Healy and Wells
(*Arenicola pusilla* [not Quatrefages], in part, in CPF, see HEALY AND WELLS 1959)

Nephridial papilla with flap over ventral half (as in Fig. 15a) 2

2 With 7–11 pairs of accessory oesophageal caeca. (See also Fig. 15a) .... *A. claparedi oceanica* Healy and Wells
(*Arenicola pusilla* [not Quatrefages], in part, in CPF, see *A. vagabunda oceanica* in HEALY AND WELLS 1959)

With 11–18 pairs of accessory oesophageal caeca .... *A. claparedi vagabunda* Healy and Wells
(See *A. vagabunda vagabunda* in HEALY AND WELLS 1959)

Arenicola Lamarck

With 19 setigers and 13 pairs of gills .... *A. marina* (Linnaeus)
(FAUVEL 1927; WELLS 1957)

Branchiomaldane Langerhans

One recognized species in genus (See also Fig. 15e) .... *B. vincenti* Langerhans

MALDANIDAE

Table 4, fig. B; Fig. 16, 17
ARWIDSSON (1907); PILGRIM (1977)

Glandular areas of the epidermis are lighter colored [may be whitish] (stippled in Fig. 16n, 17m). Posterior achaetous segments may have glandular pads [in the place of setose parapodia] (Fig. 16o, 17e).

1 Cephalic plate with conspicuous rim (as in Fig. 16e, 17h). With pygidial funnel or plate (as in Fig. 16m, r) 2

Cephalic plate absent (as in Fig. 17c). With or without pygidial plate or funnel 12

2 Anus dorsal to pygidial plate (as in Fig. 16c, r). Setiger 1 without neurosetae, setigers 2 and 3 with uncini either similar to those on following setigers or slightly modified (as in Fig. 17*l*). MALDANINAE 3

Anus central, either terminal (as in Fig. 17i) or inside funnel (as in Fig. 16m). Setiger 1 usually with neurosetae; neurosetae of first 2 or 3 setigers unmodified (as in Table 4, fig. B) or modified uncini (similar to Fig. 16*l*, 17*l*) or spines (as in Fig. 17j). EUCLYMENINAE 4

3 Cephalic plate with elevated rim [in listed species dentate, at least dorsal of lateral incision, as in Fig. 16a] and short, low median keel. Setiger 1 with anterior collar. Pygidial plate with wide rim [sometimes funnellike], with deep lateral incision (as in Fig. 16b, c) .... *Asychis*

Cephalic plate with low, smooth rim [with lateral incision] and long, high median keel (as in Fig. 16p). Setiger 1 without anterior collar. Pygidial plate with narrow rim, with weak lateral incision (as in Fig. 16q) .... *Maldane*

4 First 3 or 4 neuropodia with few [usually 1–3] setae, usually spines or modified uncini (similar to Fig. 16*l*, 17*l*). With or without pygidial funnel 5

First 2 or 3 neuropodia [absent on first in *Maldanella*] with many [at least 5, usually > 10] uncini (as in Table 4, fig. B [rarely without hairs]). With pygidial funnel (as in Fig. 16g, s [may be shallow in *Axiothella*]) and cirri 10

5 Setiger 8 with ventral triangular glandular area (as in Fig. 16h). With low or indistinct pygidial funnel .... *Clymenura*

Setiger 8 without ventral triangular glandular area. With or without pygidial funnel 6

6 Without pygidial funnel (as in Fig. 17i [cf. remark for *Praxillella praetermissa*, p. 76]) 7

With pygidial funnel (as in Fig. 16m, o) 8

7 With pygidial cirri, midventral one distinctly longer (as in Fig. 17i). First neuropodia with spines (as in Fig. 17j) or modified uncini (as in Fig. 16*l*, 17*l*) .... *Praxillella*

Without pygidial cirri. First neuropodia with modified uncini (similar to Fig. 16*l* [Pacific species]) .... *Microclymene*†

8 Glandular rings (as in Fig. 16n [may be cream colored]) pronounced on 5th and following setigers. First neuropodia with single straight spines. Pygidial cirri very short and of equal length (as in Fig. 16o) .... *Isocirrus*

Glandular rings weakly developed. First neuropodia with spines or greatly modified uncini (as in Fig. 16j, *l*) 9

9 Pygidial cirri conical or slender, midventral clearly longest (as in Fig. 16m). Glandular areas in weakly pronounced rings on setiger 5 and following segments. With fewer than 25 setigers .... *Euclymene*

Pygidial cirri slender, short, uniform in length, none midventral. With more than 31 setigers .... *Macroclymene*

10 Setiger 1 without neurosetae. Pygidial cirri conical, nearly uniform in length (as in Fig. 16s) .... *Maldanella*

Setiger 1 with 5 or more neurosetae 11

11 Pygidial cirri filiform, alternating in length [or several short between each long cirrus], midventral [usually clearly] the longest (as in Fig. 16g). Setiger 4 without membranous collar [segments may be telescoped (as in Fig. 16f), simulating collar] .... *Axiothella*

Pygidial cirri conical, nearly uniform in length. Setiger 4 with anterior membranous collar (as in Table 4, fig. B) .... *Clymenella*

This key excludes 2 Californian species with spines in the first 3 neuropodia but previously assigned to this genus (see BANSE 1981).

12 With membranous collars on 2nd and 3rd (as in Fig. 17m) as well as on posterior setigers [posterior to setae] (as in Fig. 17n). Uncini from setiger 5; in double rows in middle section of body. Pygidium conical. RHODININAE .... *Rhodine*

Without membranous collars [except *Clymenopsis*† on setiger 4]; uncini always in single row. With or without pygidial funnel or plate 13

13 With almost normal uncini (similar to Fig. 17*l*) from setiger 1. With shallow pygidial funnel .... *Micromaldane*

With spines in first 3–7 setigers. With pygidial funnel or plate 14

14 With long, hairlike (twisted) capillary notosetae, often several times longer than width of body, in median and posterior setigers (as in Fig. 17b). With pygidial funnel or scooplike fold. NICOMACHINAE 15

Without long, hairlike capillary notosetae. Without pygidial funnel; with or without pygidial plate. LUMBRICLYMENINAE 16

15 Pygidium with [symmetrical] funnel and cirri (as in Fig. 17b) .... *Nicomache*

Pygidium with asymmetrical ventral scoop, without cirri (as in Fig. 17f) .... *Petaloproctus*

16 With squat pygidial plate, anus dorsal (as in Fig. 17e). First 3 or 4 setigers with acicular spines .... *Notoproctus*

With conical pygidium, without cirri, anus terminal 17

17 Setiger 4 with anterior membranous collar (as in Table 4, fig. B). First 3 setigers with acicular spines. With 19 setigers .... *Clymenopsis*†

Setiger 4 without collar. More than first 3 setigers with spines 18

18 First 4 setigers with spines. With 19 setigers. Uncini with several thin hairs below main tooth .... *Lumbriclymene*†

First 6 or 7 setigers with spines. With 20 or more setigers. Uncini with single, thick hair below main tooth [not as in Table 4, fig. B] .... *Praxillura*

Asychis Kinberg

In the listed species, the rim of the cephalic plate is divided by 2 pairs of incisions, separating the pair of lateral lobes from the dorsal [dentate] lobe and the [ventral] palpode (as in Fig. 16d); setiger 1 has a collar (as in Fig. 16a, e [sometimes not well developed]); the pygidial plate may be serrated but long, slender cirri are lacking.
The revision of the genus by Light (1981) which could not be considered here, should be consulted.

1 Lateral lobe of cephalic plate with smooth (Fig. 16e), or nearly so, margin. Ventral lobe of pygidial plate low, moderately erect, with slightly undulating margin; dorsal lobe large and flaring, with smooth margin. Nuchal organs reaching margin of cephalic plate (as in Fig. 16a) .... *A. similis* (Moore)

Lateral lobe of cephalic plate with dentate margin (as in Fig. 16d) 2

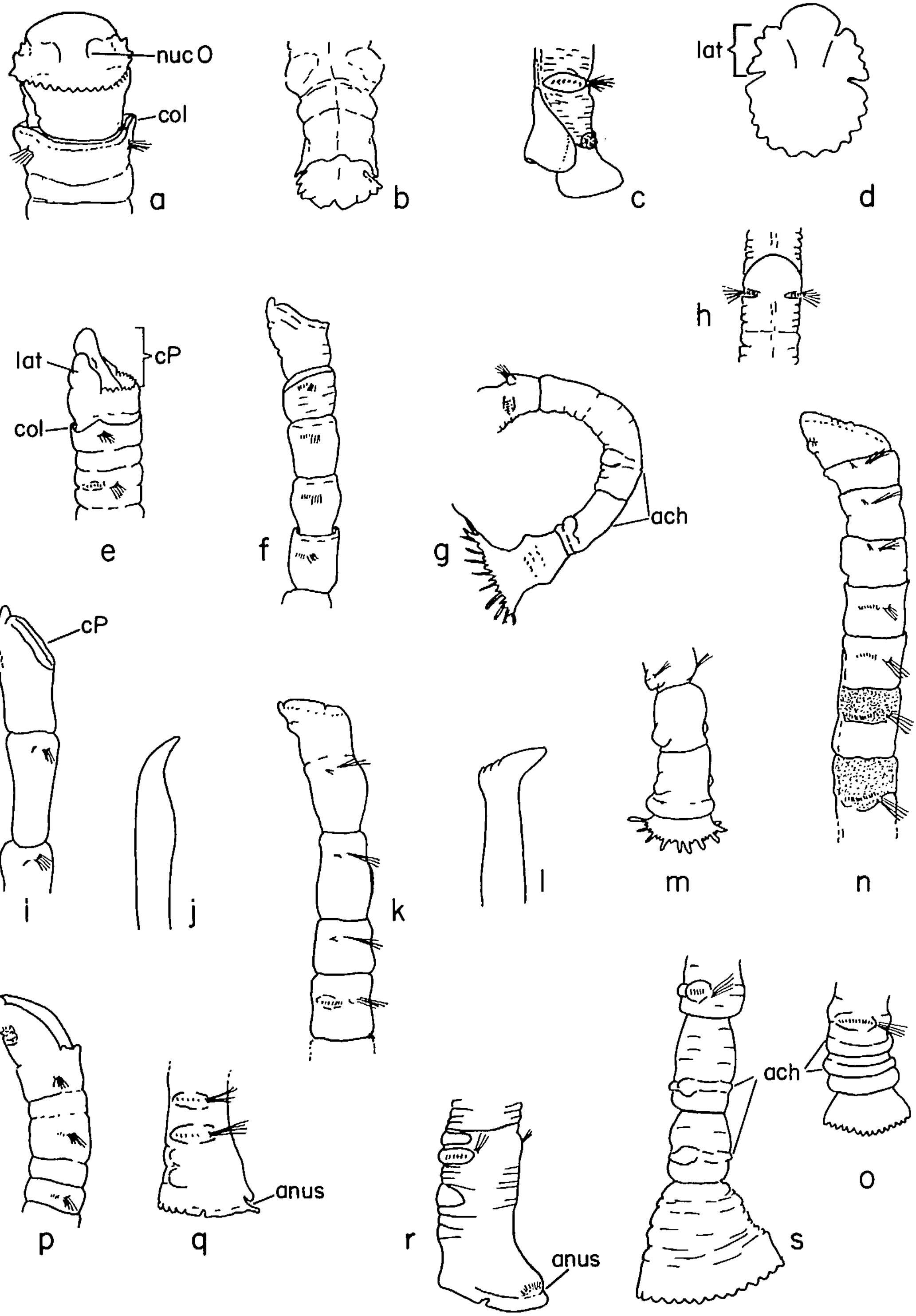
2 Lobes of pygidial plate long, with smooth margins (Fig. 16c). Dorsal lobe of cephalic plate with about 12 moderately pronounced teeth .... *A. disparidenta* Moore

Lobes of pygidial plate low, with undulating or dentate margins (as in Fig. 16b) 3

3 Margin of each pygidial lobe with 4 or more irregular teeth. Dorsal lobe of cephalic plate with about 12 strong teeth (Fig. 16d) .... *A. lacera* (Moore)
(See Hartman 1969; Berkeley and Berkeley 1962)

Margin of pygidial lobes undulating or each with few weak teeth; dorsal lobe usually with fewer [2 or 3] teeth than in Fig. 16b, ventral lobe with 2 or 3. Dorsal lobe of cephalic plate short (Fig. 16a), with usually more than 12, up to 25 [50] teeth .... *A. biceps* (Sars)

Berkeley (1966) reported 40–50 teeth for animals from British Columbia (size not given), whereas the maximum number of teeth in European specimens of more than 10 cm length is 25 (Arwidsson 1907).
Based on the available literature and the variability of the teeth on the cephalic plate in British Columbia material, Berkeley and Berkeley (1962) surmised that *A. similis* and *A. lacera* might be synonyms of *A. biceps*.



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Axiothella Verrill

Rim of cephalic plate with middorsal notch. With 2 [not 3] achaetous posterior segments followed by welted ring (Fig. 16g) .... *A. rubrocincta* (Johnson)

Clymenella Verrill

As in generic key .... *C. torquata* (Leidy)
(See NEWELL 1949; BANSE 1981)

Clymenura Verrill

Rim of cephalic plate conspicuous. Pygidial cirri numerous, short except for long, midventral one. (See also Fig. 16h) .... *C. columbiana* (Berkeley)
(*Leiochone columbiana* in CPF)

Euclymene Verrill

1 Anterior end and setiger 1 fused, epidermis markedly reticulated. Pygidial cirri of uniform, moderate length .... *E. reticulata* Moore*
(See HARTMAN 1969; CAREY 1972)

Anterior end and setiger 1 not fused (segmental border distinct as in Fig. 16i), with epidermis smooth or annulated. Pygidial cirri uniform or alternating in length 2

2 Lateral notches of cephalic rim indistinct or absent (Fig. 16i). Setigers 1–3 with spines (Fig. 16j). Pygidial cirri of about equal length .... *E. zonalis* (Verrill)

According to MANGUM (1962), the anterior setigers of *E. zonalis* [as *Clymenella zonalis*] from near the type locality (U.S. east coast) have modified uncini rather than spines.

Lateral notches of cephalic rim distinct (Fig. 16k). Setiger 1 with spines, 2 and 3 with modified uncini (Fig. 16*l*). Pygidial cirri alternating in length (Fig. 16m) .... *E.* cf. *zonalis* (Verrill)
(See BANSE ET AL. 1968)

FIG. 16. MALDANIDAE: *Asychis biceps*: a, anterior end, dorsal view; b, posterior end, ventral view. *A. disparidenta*: c, posterior end, lateral view. *A. lacera*: d, cephalic plate, top view [ventral side up]. *A. similis*: e, anterior end, lateral view. *Axiothella rubrocincta*: f, anterior end, lateral view; g, posterior end, lateral view. *Clymenura columbiana*: h, setiger 8, ventral view. *Euclymene zonalis*: i, anterior end, lateral view; j, spine of setiger 2. *Euclymene* cf. *zonalis*: k, anterior end, lateral view; *l*, modified uncinus of setiger 2; m, posterior end, dorsolateral view. *Isocirrus longiceps*: n, anterior end, lateral view; o, posterior end, lateral view. *Maldane glebifex*: p, anterior end, lateral view; q, posterior end, lateral view. *M. sarsi*: r, posterior end, lateral view. *Maldanella harai*: s, posterior end, lateral view. Sources: a, b, Wesenberg-Lund (1948); c, e, f, h–j, p, CPF; d, Hartman (1969); g, Arwidsson 1922; k–o, q, s, original; r, Ushakov (1955) [a, b, e, g, h, j, r, modified].

Isocirrus Arwidsson

With 19 setigers [not 21 or more]. Setiger 3 often markedly telescoped into 4th, simulating collar; setigers 2 and 4 sometimes telescoped into setigers 3 and 5. (See also Fig. 16n, o) .... *I. longiceps* (Moore)

Macroclymene Verrill

Body up to 1 mm thick .... *Macroclymene* sp.
(See Banse and Hobson 1968)

Maldane Grube

1 Ventral rim of pygidial plate dentate (Fig. 16q). (See also Fig. 16p) .... *M. glebifex* Grube

Ventral rim of pygidial plate entire, essentially smooth (Fig. 16r) .... *M. sarsi sarsi* Malmgren
(See Pettibone 1954; Berkeley 1966)

Maldanella McIntosh

1 With one achaetous posterior segment. Rim of cephalic plate faintly crenulated .... *M. robusta* Moore
(See Moore 1906b; not *M. robusta* in CPF, see Banse 1981 under *M. harai*)

With two achaetous posterior segments (Fig. 16s). Rim of cephalic plate smooth .... *M. harai* (Izuka)
(See Imajima and Hartman 1964; *M. robusta* [not Moore] in CPF, see Banse 1981)

Micromaldane Mesnil

Notosetae subspatulate (Fig. 17a) .... *M. ornithochaeta* Mesnil
(See Fauvel 1927; Berkeley and Berkeley 1962)
Possibly a postlarval stage, perhaps of *Nicomache* sp. (Fauvel 1927)

Nicomache Malmgren

The listed species have 22 setigers and a very slightly oblique pygidial funnel.

1 With 1 achaetous posterior segment. Anterior end with conspicuous white and chocolate-brown markings (Fig. 17c [may fade in preservative]) .... *N. personata* Johnson

Usually with 2 achaetous posterior segments (Fig. 17b). Anterior end without conspicuous white markings. First 3 [not 4] setigers with spines; setigers 4 and 5 with modified uncini .... *N. lumbricalis* (Fabricius)

Notoproctus Arwidsson

With 1 or 2 [not 3] posterior achaetous segments (Fig. 17e). Outer limbs of nuchal organs longer than inner (Fig. 17d). With whitish ring behind frontal face of anterior end, white dorsal bands between notopodia of about first 6 setigers [may fade in preservative] .... *N. pacificus* (Moore)

Occasionally, setiger 19 may be without setae so that there are 3 posterior achaetous segments (CPF).

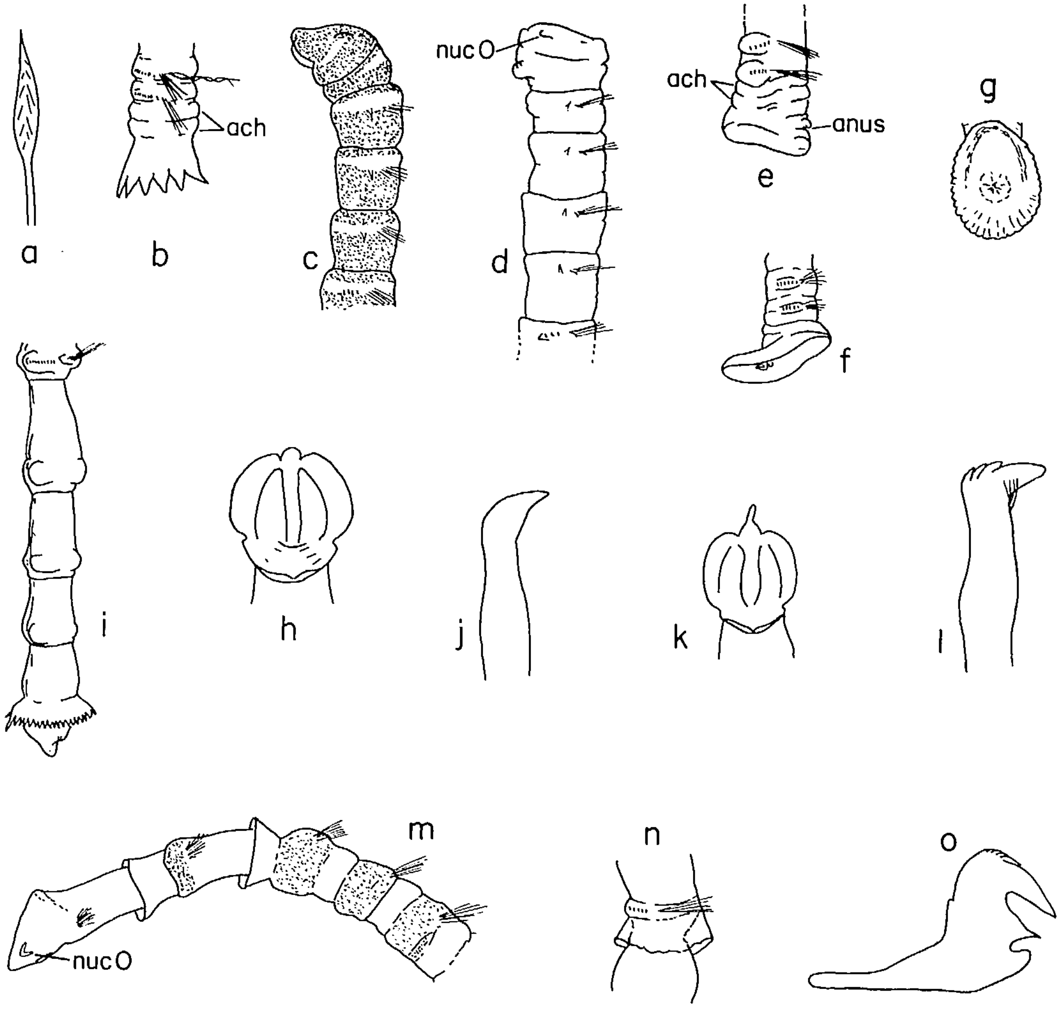


FIG. 17. MALDANIDAE: *Micromaldane ornithochaeta*: a, subspatulate notoseta. *Nicomache lumbricalis*: b, posterior end, lateral view. *N. personata*: c, anterior end, lateral view. *Notoproctus pacificus*: d, anterior end, lateral view; e, posterior end, lateral view. *Petaloproctus tenuis borealis*: f, posterior end, lateral view. *P. tenuis tenuis*: g, posterior end, end view. *Praxillella affinis pacifica*: h, cephalic plate, dorsal view; i, posterior end, lateral view; j, spine from setiger 2. *Pr. gracilis*: k, cephalic plate, dorsal view. *Pr. praetermissa*: *l*, slightly modified uncinus from setiger 2. *Rhodine bitorquata*: m, anterior end, lateral view; n, posterior part of setiger 17, lateral view; o, uncinus. Sources: a, Fauvel (1927); b, d, e, i, n, o, original; c, f–h, j, k, CPF; *l*, Banse (1981); m, Hartman (1969) [h, j–*l*, modified].

Petaloproctus Quatrefages

1 With 20 setigers. Pygidial scoop with crenulate or toothed margin (Fig. 17g) .... *P. tenuis tenuis* (Théel)

With 21 setigers. Pygidial scoop with smooth margin (Fig. 17f) .... *P. tenuis borealis* Arwidsson

BERKELEY's (1929) description of *P. tenuis borealis* differs from the original description by ARWIDSSON (1907) in having spines on the first 2 [rather than 3] setigers.

Praxillella Verrill

The listed species do not have a distinct collar on setiger 5. The first 3 anterior neuropodia carry 1–3 spines or modified uncini [sometimes more in *P. praetermissa*]. The anterior 2 of the posterior achaetous segments have pads (as in Fig. 17i). The length of the pygidial cirri is much less than the width of the pygidium.

1 With 3 posterior achaetous segments. Prostomium anteriorly obtuse (as in Fig. 17h) or pointed (as in Fig. 17k) 2

With 4 posterior achaetous segments. Prostomium anteriorly obtuse 3

2 Prostomium anteriorly obtuse (as in Fig. 17h). With 18 setigers .... *P. affinis affinis* (Sars)

(See *Clymene affinis* in FAUVEL 1927; *P. affinis* in BERKELEY AND BERKELEY 1962)

Prostomium with fingerlike projection (Fig. 17k) .... *P. gracilis* (Sars)

3 Setigers 1–3 with spines (Fig. 17j). (See also Fig. 17h, i) .... *P. affinis pacifica* Berkeley

Setigers 1–3 with slightly modified uncini (Fig. 17*l*) .... *P. praetermissa* (Malmgren)

(See BANSE 1981)

The posterior end if contracted simulates a pygidial funnel.

Praxillura Verrill

Anterior end and setigers with spines with abundant, mottled red-brown pigment .... *P. maculata* Moore

(See HARTMAN 1969; MCDANIEL AND BANSE 1979)

Rhodine Malmgren

Uncini with long [not short] projection below principal tooth (Fig. 17o). Posterior collar from setiger 17, margin smooth [or nearly so] (Fig. 17n). Limbs of nuchal organs forming pointed angle (Fig. 17m) .... *R. bitorquata* Moore

(See BANSE AND HOBSON 1968)

Posterior collars start on setiger 15 according to HARTMAN (1969).

OWENIIDAE
(AMMOCHARIDAE IN CPF)

Table 4, fig. C; Fig. 18
HARTMAN (1960)

1 Anterior end with branched membranous funnel, crownlike in adult (as in Fig. 18d) .... *Owenia*

Anterior end without branched membranous funnel (as in Fig. 18a, c) 2

2 Without palps (as in Fig. 18a) .... *Myriochele*

With palps (as in Fig. 18c) .... *Myriowenia*†

Myriochele Malmgren

Anterior end with eyespot on each side and dorsal pigment band (Fig. 18a [may fade in preservative]); without dorsal flap extending to setiger 3. Neuropodial hooks with 2 adjacent teeth, clearly unequal in length (Fig. 18b). With 27 setigers, the first 3 much shorter than following. Pygidium with 2 or 3 indistinct [not 7–9 distinct] lobes .... *M. oculata* Zachs

(*M. heeri* [not Malmgren] in CPF, see HOBSON 1977)

Owenia delle Chiaje

Anterior end with 2 ventral eyespots; collar low, dorsally barely concealing base of funnel (Fig. 18d) .... *O. fusiformis* delle Chiaje

(*Ammochares fusiformis* in CPF)

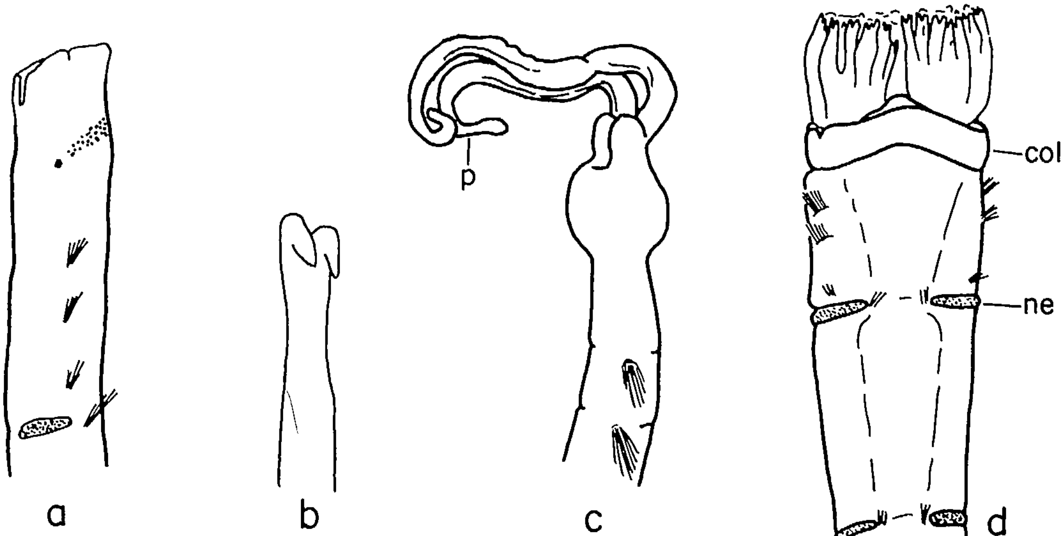


FIG. 18. OWENIIDAE: *Myriochele oculata*: a, anterior end, lateral view; b, neuropodial hook. *Myriowenia*† sp.: c, anterior end, lateral view. *Owenia fusiformis*: d, anterior end, dorsal view. Sources: a, d, original; b, Blake and Dean (1973); c, Hartman (1960) [b, c, modified].

SABELLARIIDAE

Table 4, fig. E; Fig. 19

HARTMAN (1944)

Opercular paleae occur in 2 or 3 concentric rows on the anterior end; thoracic paleae occur on 3 segments in the listed genera (see Table 4, fig. E).

1 Opercular paleae dark or black, forming compact flat operculum; inner row covered by outer row .... *Phragmatopoma*†

Opercular paleae yellow, in bristly rows; inner row not covered by middle [or outer] row (as in Table 4, fig. E) 2

2 Anterior end with 3 visible rows of opercular paleae (as in Table 4, fig. E); without stout dorsal hooks .... *Sabellaria*

Anterior end with 2 visible rows of opercular paleae; with stout dorsal hooks (as in Fig. 19a) .... *Idanthyrsus*

Idanthyrsus Kinberg

Outer row of opercular paleae of listed species with nearly straight [terminally not strongly curved] shaft.

1 Thoracic paleae distally widened [oar-shaped] (Fig. 19b). (See also Fig. 19a) .... *I. armatus* Kinberg

(In CPF, see also BANSE ET AL. 1968)

Thoracic paleae distally not widened (Fig. 19c) .... *I. ornamentatus* Chamberlin

(See HARTMAN 1969)

The species is regarded as a synonym of *I. armatus* by PETTIBONE (1954) but not by HARTMAN (1944, 1948) and REISH (1965).

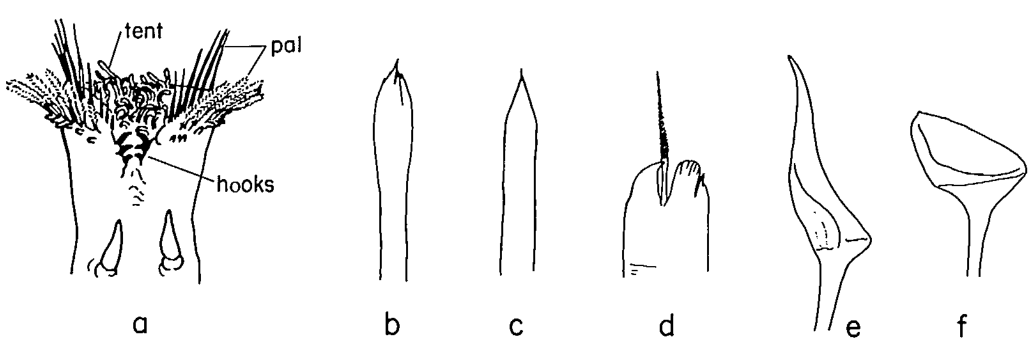


FIG. 19. SABELLARIIDAE: *Idanthyrsus armatus*: a, anterior end, dorsal view; b, thoracic palea. *I. ornamentatus*: c, outer opercular palea. *Sabellaria cementarium*: d, tip of outer opercular palea; e, middle opercular palea; f, inner opercular palea. Sources: a, CPF; b, Banse et al. (1968); c, Chamberlin (1919); d–f, Hartman (1944) [c, modified].

Sabellaria Savigny

Opercular paleae of outer row with distal hairy spike (Fig. 19d); paleae of middle row (Fig. 19e) uniform in length; paleae of inner row broader than paleae of middle row, distally smooth (Fig. 19f) .... *S. cementarium* Moore

AMPHICTENIDAE

(PECTINARIIDAE IN CPF)

Table 4, fig. F; Fig. 20

HARTMAN (1941b); NILSSON (1928)

Scaphal hooks are inserted dorsally at the constriction between the scaphe [caudal region] and the rest of the body (as in Table 4, fig. F). The cephalic plate is placed anterodorsally (as in Table 4, fig. F). The antennular membrane is located ventrally between the paleae and the tentacles (as in Fig. 20f).

Scaphe sharply set off from rest of body (as in Table 4, fig. F). Antennular membrane with numerous slender cirri (as in Fig. 20f) .... *Pectinaria*

Pectinaria Lamarck

Although *Pectinaria* is a junior objective synonym of *Cistena* Leach, the former name is used here. A proposal to validate *Pectinaria* on the basis of stability in scientific names has been requested from the Commission of Zoological Nomenclature (See Bull. Zool. Nomencl. *35*: 18–29, 1978). The status of the subgeneric names, *Lagis*† and *Pectinaria,* also may be affected by the Commission's decision.

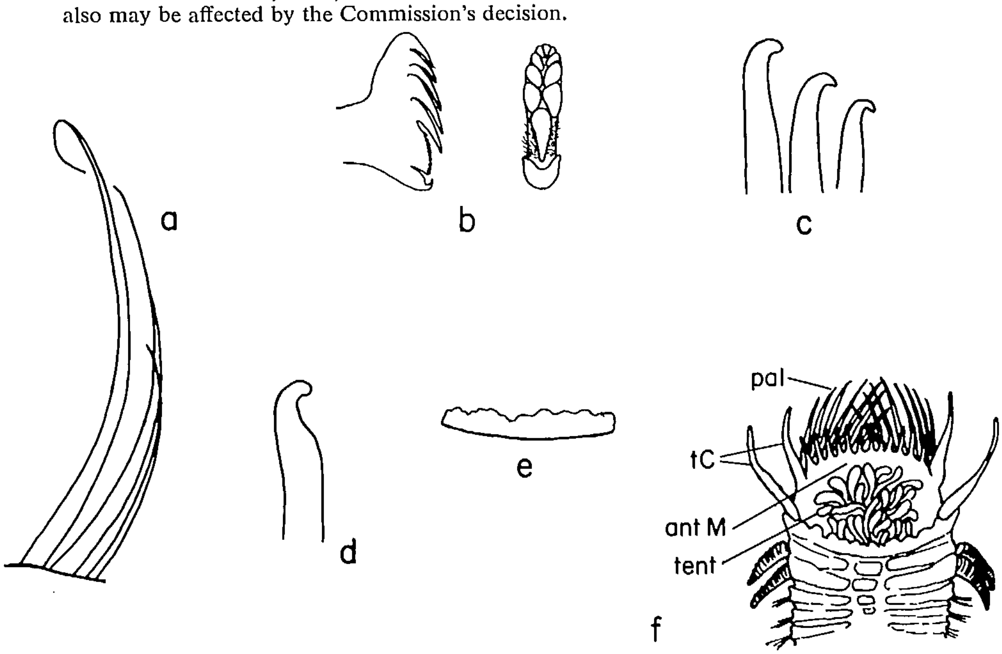


FIG. 20. AMPHICTENIDAE: *Pectinaria californiensis*: a, outermost paleae; b, pectinate uncinus, frontal and side view; c, scaphal hooks. *P. granulata*: d, scaphal hook. *P. moorei*: e, part of dorsal rim of cephalic plate. *P.* (*Lagis*†) sp.: f, anterior end, ventral view. Sources: a–d, Hartman (1941b); e, Ushakov (1955); f, Day (1967) [b, d, f, modified].

1 Antennular membrane fused to base of first pair of tentacular cirri (as in Fig. 20f) .... Subgenus *Lagis*†

Antennular membrane not fused to base of tentacular cirri 2

2 Dorsal rim of cephalic plate fringed or undulating. Subgenus *Amphictene*. Dorsal rim of cephalic plate unevenly undulating (Fig. 20e). With 13 uncinigers. Uncini with 4 or 5 major teeth in single row. With 8–10 weakly curved scaphal hooks on each side .... *P. moorei* Annenkova

(*P. auricoma* [not Müller] in CPF, see Hobson 1977)

Dorsal rim of cephalic plate smooth (as in Table 4, fig. F) 3

3 Uncini normally with 1 row of major teeth. Subgenus *Cistenides*.
With 12 uncinigers; uncini with 3 or 4 major teeth [side view], usually in single row. With 7–13 short, broad brassy paleae on each side, tips blunt or short, straight, hairlike. With 5–10 weakly curved scaphal hooks on each side, "shoulder" distinct (Fig. 20d). Tube of coarse sand grains .... *P. granulata* (Linnaeus)

(*P. brevicoma* Johnson in CPF, see Banse and Hobson 1968)

In small animals, a single neuropodium may have uncini with 2 rows of major teeth as well as those with 1 row (see Banse and Hobson 1968).

Uncini with 2 or more rows of major teeth (as in Fig. 20b). Subgenus *Pectinaria*.
With 13 uncinigers; uncini with 5 or 6 major teeth [side view] (Fig. 20b). With 13–18 long, slender coppery paleae on each side, tips long, recurved, hairlike (Fig. 20a). With 8–14 weakly curved scaphal hooks on each side, without distinct "shoulder" (Fig. 20c). Tube of fine sand grains .... *P. californiensis* Hartman

(*P. belgica* [not Pallas] in CPF, see Nichols 1975)

AMPHARETIDAE Malmgren

Table 5, fig. A; Fig. 21

Day (1964); Fauchald (1972)

Notosetae are present only in thoracic setigers. They may be small in setigers 4–6, partially hidden under the bases of the gills on segment 4 (as in Fig. 21k) or lacking (as in Fig. 21c). The flabellum is the bundle of setae on segment 3 [anterior to the gills; may be absent]; its setae may be capillaries or, if conspicuously larger than the notosetae on median setigers, paleae. The tips of the paleae are best studied in short (recently formed) setae as those of older paleae may be worn. The first unciniger [observe neuropodium] always is segment 7; the neuropodia are inserted posteriorly on each segment (see Fig. 21c). Note that the ventral cirrus if present inserts dorsally on the neuropodium (see Fig. 21h, m). Abdominal notopodia are rudimentary, either cirriform or papillate (as in Fig. 21h, r); they may be present, at least anteriorly, or absent.

1 With minute acicular neurosetae on 3 or 4 segments before segment 7 (as in Fig. 21q). MELINNINAE.
With single pair of large hooks (as in Fig. 21o, p) dorsally behind gills .... *Melinna*

Without acicular neurosetae or dorsal hooks. AMPHARETINAE 2

2 With 3 pairs of gills. Abdominal neuropodium without distinct cirrus [do not confuse with rudimentary notopodium] 3

With 4 pairs of gills [detached gills leave scars]. Abdominal neuropodium with or without cirrus 5

3 Flabellum without paleae, setae short. With 12 thoracic uncinigers. With dorsal transverse ridge anteriorly on unciniger 1 .... *Melinnampharete*†

Flabellum absent 4

4 With 11 thoracic uncinigers .... *Glyphanostomum*†

With 14 thoracic uncinigers .... *Samytha*

5 With flabellum (as in Fig. 21c) 6

Without flabellum 11

6 With 11 thoracic uncinigers. Flabellum without paleae, setae short. Abdomen without rudimentary notopodia; neuropodium with distinct cirrus (as in Fig. 21m) .... *Sabellides*†

With 12 or more thoracic uncinigers. Flabellum with paleae or thin setae 7

7 With 12 thoracic uncinigers. Flabellum with paleae 8

With 13 or 14 thoracic uncinigers. Flabellum with paleae or thin setae 9

8 With notosetae on 3 setigers between segments 3 and 7 [first notopodium very small, with one to very few setae; study both sides while turning the specimen]. Fifth-to-last [local species] notopodium slightly displaced dorsad, connected by whitish ridge; notosetae slightly shorter than those on other setigers, with finely serrated tips (as in Fig. 21*l*) .... *Anobothrus*

With notosetae on 2 setigers between segments 3 and 7 (as in Fig. 21c). All notopodia aligned, not connected by ridge .... *Ampharete*

9 Flabellum with paleae. With 14 thoracic uncinigers. Abdominal neuropodium with cirrus (as in Fig. 21h) .... *Amphicteis*

Flabellum without paleae 10

10 Flabellum with short setae. With 13 thoracic uncinigers [species in cool–temperate North Pacific]. Abdominal neuropodium without cirrus .... *Lysippe*

Flabellum with long setae. With 14 thoracic uncinigers. Abdominal neuropodium with long cirrus (as in Fig. 21m) .... *Hobsonia*

11 Third-from-last thoracic notopodium inserted dorsally, enlarged, with broad fan of setae .... *Sosanopsis*

All thoracic notopodia aligned 12

12 With 11 thoracic uncinigers. Abdomen with rudimentary notopodia .... *Amage*

With 12 or more thoracic uncinigers. Abdomen with or without rudimentary notopodia 13

13 With 14 thoracic uncinigers. Ventral prostomial lip crenulated (as in Fig. 21k). Abdomen with rudimentary notopodia .... *Amphisamytha*

With 12 thoracic uncinigers. Ventral prostomial lip smooth. Abdomen with or without rudimentary notopodia 14

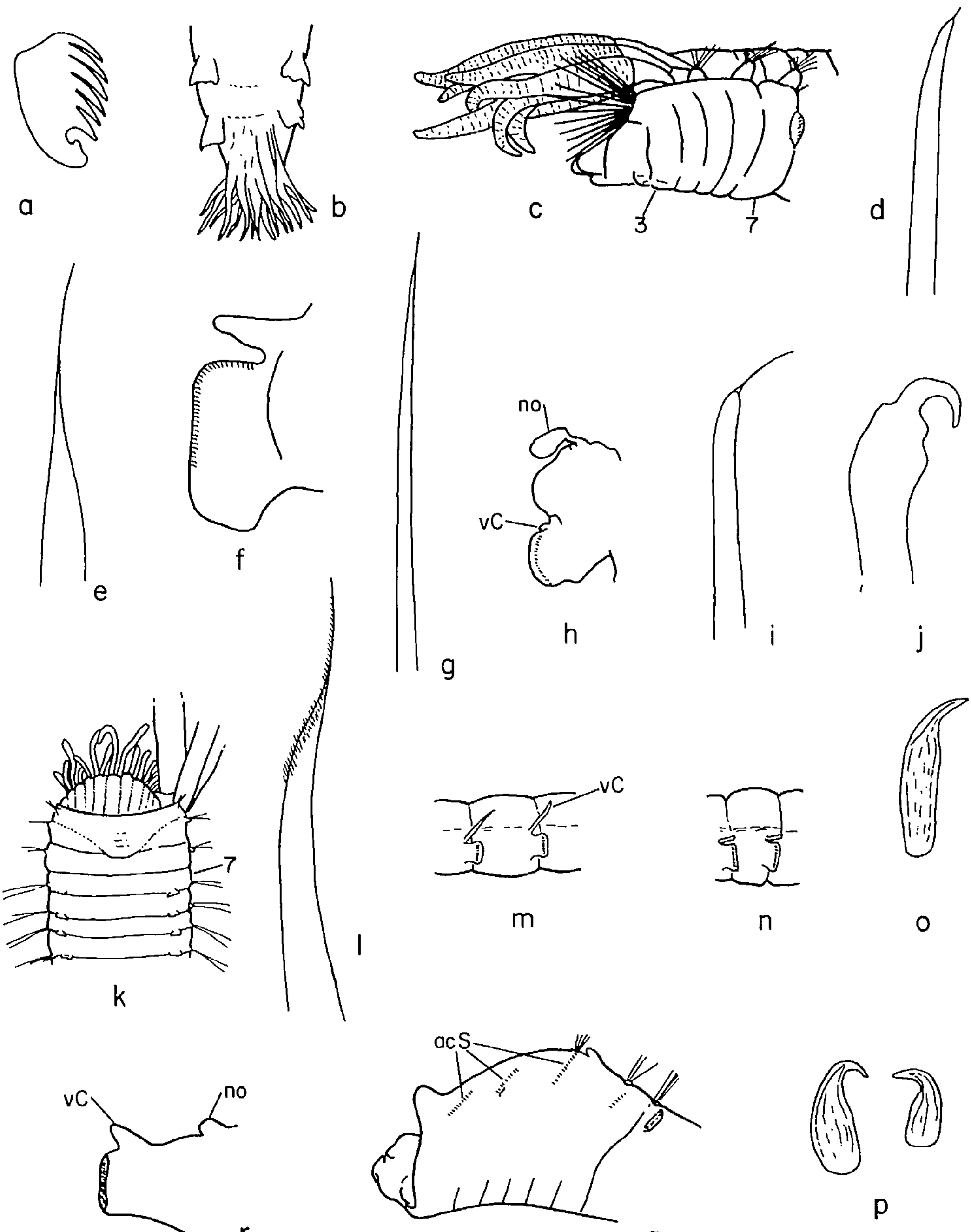
14 First 2 thoracic segments without neuropodia. All gills smooth, on each side with 1 gill behind 3 in transverse row. Abdomen without rudimentary notopodia .... *Asabellides*

First 3 thoracic segments without neuropodia. One pair of gills smooth, 3 pairs lamellate. Abdomen with rudimentary notopodia (as in Fig. 21r) .... *Schistocomus*

Amage Malmgren

With 12–15 abdominal setigers. Thoracic uncinus with 5 or 6 teeth in single row (Fig. 21a) .... *A. anops* (Johnson)
(In CPF, see also Banse 1979b)

Fig. 21. AMPHARETIDAE: *Amage anops*: a, thoracic uncinus. *Ampharete acutifrons*: b, posterior end, ventral view. *A. finmarchica*: c, anterior end, lateral view; d, tip of palea. *A. goesi brazhnikovi*: e, tip of palea; f, anterior abdominal parapodium. *Amphicteis glabra**: g, tip of palea; h, abdominal parapodium. *Am. mucronata*: i, tip of palea. *Am. scaphobranchiata*: j, tip of foliose gill. *Amphisamytha bioculata*: k, anterior end, ventral view [most gills lost]. *Anobothrus gracilis*: *l*, notoseta of unciniger 8. *Asabellides lineata*: m, abdominal segments, lateral view. *As. sibirica*: n, abdominal segments, lateral view. *Melinna cristata*: o, dorsal hook. *M. elisabethae*: p, dorsal hooks. *Melinna* sp.: q, anterior end, lateral view [tentacles and gills lost]. *Schistocomus hiltoni*: r, abdominal parapodium. Sources: a, e, f, Banse (1979b); b, o, p, Ushakov (1955); c, Hartmann-Schröder (1971); d, *l*, Hessle (1917); g, h, Moore (1906a); i, m, n, CPF; j, Moore (1906b); k, r, Hartman (1969); q, combined from Hartman (1969) and Ushakov (1955) [b, c, j, k, n–p, r, modified].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Ampharete Malmgren

1 Edge of prostomial upper lip (see Table 5, fig. A) with very numerous eyespots [inspect lip from ventral side] .... *A. labrops* Hartman
(See HARTMAN 1969; BANSE 1979b)

Upper lip without eyespots 2

2 Anal end surrounded by numerous (about 20) cirri (Fig. 21b). With 12 abdominal setigers .... *A. acutifrons* (Grube)
(See HARTMAN 1969, BANSE 1979b; PETTIBONE 1954)

Anal end with two [or no] cirri, sometimes also with numerous papillae. With more than 12 abdominal setigers 3

3 With 13 abdominal setigers. With 12–16 pairs of paleae [not 6], reaching only slightly beyond anterior edge of prostomium [not 2 or 3 times as long as prostomium], abruptly tapered, with short sharp tips (Fig. 21d). Gills almost in single row on each side. (See also Fig. 21c) .... *A. finmarchica* (Sars)
(*A. arctica* Malmgren in CPF, see WOLLEBAEK 1912 for synonymy)

With 16 or 17 abdominal setigers 4

4 With 16 abdominal setigers; neuropodium with distinct cirrus (Fig. 21f). Paleae with long tips (Fig. 21e) .... *A. goesi brazhnikovi* Annenkova
(See ANNENKOVA 1929; BANSE 1979b)

With 17 abdominal setigers; neuropodium with indistinct cirrus. Paleae abruptly tapered, with short tips (as in Fig. 21d) .... *A. goesi goesi* Malmgren
(*A. goesi* in CPF)

Amphicteis Grube

The listed species have 13 to 15 [not 19 or more] abdominal setigers.

1 Anteriomedian pair of gills foliose, with slender tips (Fig. 21j). With up to 15 abdominal setigers. Paleae gradually tapered .... *A. scaphobranchiata* Moore

All gills cirriform. With 15 [14] abdominal setigers. With about 10 [not 20] paleae on each side 2

2 Paleae abruptly tapered, with fine tips (Fig. 21i [tips may be worn]) .... *A. mucronata* Moore

Paleae gradually tapered, with long fine tips (Fig. 21g). Abdominal rudimentary notopodium ovoid [not cylindrical], with short stem. Abdominal neuropodial cirrus very small (Fig. 21h) .... *A. glabra* Moore*
(See HARTMAN 1969)

Amphisamytha Hessle

Right and left groups of gills close together, separated by less than proximal diameter of single gill. With about 13–14 abdominal setigers. (See also Fig. 21k) .... *A. bioculata* (Moore)

Anobothrus Levinsen

Fifth-to-last notopodium (unciniger 8) very slightly displaced dorsad, often projecting differently from others. (See also Fig. 21*l*) .... *A. gracilis* (Malmgren)

(In CPF, see also Berkeley 1966)

Banse (1979b) referred specimens identified by Banse and Hobson (1968) as *Ampharete gagarae* [not Ushakov] to this species.

Asabellides Annenkova

The listed species have more than 12 abdominal setigers.

1 Abdominal neuropodium with long slender cirrus (Fig. 21m) .... *A. lineata* (Berkeley and Berkeley)

(*Pseudosabellides lineata* in CPF)

Abdominal neuropodium with small cirrus (Fig. 21n) .... *A. sibirica* (Wirén)

(*Pseudosabellides littoralis* Berkeley and Berkeley in CPF, see Hartman 1959)

Hobsonia Banse

With more than 20 [23–26] abdominal setigers .... *H. florida* (Hartman)

(See Banse 1979b)

Lysippe Malmgren

Lower prostomial lip crenulated [similar to Fig. 21k]. With about 14 abdominal setigers .... *L. labiata* Malmgren

(In CPF, see also Banse 1979b)

Melinna Malmgren

1 Dorsal hooks long, with slightly bent tips (Fig. 21o). Transverse dorsal fold posterior to hooks with 10–20 teeth [not 3 or 4] .... *M. cristata* (Sars)

Dorsal hooks short, with sharply bent tips (Fig. 21p) .... *M. elisabethae* McIntosh

(See Ushakov 1955; Banse and Hobson 1968)

Samytha Malmgren

With 19–20 abdominal setigers .... *S. californiensis* Hartman
(See HARTMAN 1969; BANSE 1979b)
The key does not distinguish this species from *S. gurjanovae* Ushakov† (see USHAKOV 1955).

Schistocomus Chamberlin

Median abdominal neuropodium with distinct cirrus [not small knob] (Fig. 21r) .... *S. hiltoni* Chamberlin

Sosanopsis Hessle

Thoracic uncinigers 9 and 10 [latter with modified notopodium] with ridges across dorsum .... *S. hesslei* Banse
(See BANSE 1979b)

TEREBELLIDAE

Table 5, fig. B; Fig. 22, 23
DAY (1967); HESSLE (1917)

Eyes when present are above and behind the tentacles on the reduced, beltlike prostomium. Some anterior segments may develop lateral lappets (as in Fig. 22j, n). Gills, when present, typically begin on segment 2 [3 in *Betapista*; 4 in *Scionella japonica*]. Setae occur usually from segment 2 to 4 onwards. Notosetae in most genera are restricted to [and thus indicate] the thorax and often are arranged in a parapodium in an upper and lower series, with the setae longer in the upper series. With a few exceptions, they may be limbate with smooth (as in Fig. 22e), denticulate (as in Fig. 22g), or hairy tips (as in Fig. 23j), or may have serrate blades (as in Fig. 23*l*). Nephridial papillae [including gonoducts] when present are situated on some thoracic segments behind and somewhat above or below the notopodia (as in Fig. 22j). Light-colored pads, the ventral shields, occur on the ventral surface of the thorax (as in Table 5, fig. B).

1 Anterior end with large proboscislike extension (as in Fig. 22b). ARTACAMINAE.
Extension papillated. With 17 thoracic setigers .... *Artacama*

Anterior end without extension 2

2 Uncini in single row [with main teeth pointing in same direction rather than alternating; row may form loop in middle and posterior thorax as in Fig. 23p] or absent 3

Uncini in double row from segment 11 [sometimes before 11] to at least end of thorax, usually interlocking (as in Fig. 22i), occasionally separated into 2 rows with teeth pointing in opposing directions (as in Fig. 22f); in single row elsewhere. AMPHITRITINAE 4

3 Without gills. Notosetae on anterior segments or absent [dissect if specimen is not transparent]. POLYCIRRINAE 21

With 2 or 3 pairs of simple [threadlike] gills. Notosetae on most segments. THELEPINAE 24

4 Gills absent 5

Gills present 9

5 Setigers 1–6 without uncini .... *Laphania*

Setiger 1 without uncini, setiger 2 with or without uncini 6

6 Setiger 2 without uncini. Short notosetae strongly serrate, comblike (as in Fig. 23*l*) in last 8 segments with notosetae .... *Proclea*

Setiger 2 with uncini 7

7 Without lateral lappets. Long notosetae [sometimes also short] with subdistal spinose swelling (as in Fig. 23n) .... *Spinosphaera*†

With lateral lappets (as in Fig. 22j, n). Long and short notosetae limbate (as in Fig. 22d, e) 8

8 Segment 3 [first uncini on segment 5] with ridge across dorsum. Notosetae with smooth tips (as in Fig. 22e) .... *Leaena**

Segment 3 without dorsal ridge. Notosetae with denticulate tips (as in Fig. 22d) .... *Lanassa*

9 Thoracic notosetae distally smooth (as in Fig. 22e) [except in *Scionella japonica*; use high magnification] 10

Thoracic notosetae distally distinctly denticulate (as in Fig. 22g [sometimes more strongly denticulate]) 18

10 Notosetae on 13 segments. With 1 pair of gills .... *Ramex*†

Notosetae on more than 13 segments. With 1–3 pairs of gills 11

11 Thoracic uncini [at least on first 3 uncinigers] with handles (as in Fig. 22k). With lateral lappets [conspicuous in listed species] 12

Thoracic uncini without handles. With or without lateral lappets 13

12 Last [or only] pair of gills anterior to segment 5 (as in Fig. 22n) [uncini start on segment 5] .... *Pista*

Last [third] pair of gills on segment 5 (as in Fig. 22c) .... *Betapista*

13 Uncini pectinate (as in Fig. 22f). With 3 pairs of gills .... *Loimia**

Uncini avicular (as in Table 5, fig. B). With 1–3 pairs of gills 14

14 With 1 pair of gills on segment 2 or 4 15

With 2 or 3 pairs of gills from segment 2. Notosetae from segment 4, uncini from segment 5 16

15 Gills on segment 2. Notosetae from segment 2, uncini from segment 3. Without fold or ridge across dorsum of segment 4 .... *Spiroverma*†

Gills on segment 2 or 4. Notosetae from segment 4, uncini from segment 5. With fold or ridge across dorsum of segment 4 [may form an oblique plaque] (as in Fig. 23m) .... *Scionella*

16 With 2 pairs of gills. Without lateral lappets. Toothed parts of uncini in posterior thorax facing each other (as in Fig. 22i) .... *Nicolea*

With 3 pairs of gills. With lateral lappets. Toothed parts of uncini in posterior thorax facing each other, or uncini inserted back-to-back (as in Fig. 22f) 17

17 With small lateral lappets (as from segment 2 in Fig. 22j). Toothed parts of uncini in posterior thorax facing each other (as in Fig. 22i) .... *Eupolymnia*

With large lateral lappets, arranged as in Fig. 22n. Uncini in posterior thorax inserted back-to-back (as in Fig. 22f [but avicular, as in Table 5, fig. B]) .... *Lanice**

18 Notosetae from segment 3 [may be hidden under 2nd gill], uncini from segment 5. With 2 pairs of gills .... *Neoleprea*

Notosetae from segment 4, uncini from segment 5. With 3 pairs of gills [NE Pacific species] 19

19 Gills simple filaments (as in Fig. 22a) .... *Amphitrite*

Gills branched (as in Fig. 22h, n) 20

20 Notosetae on less than 25 segments. With small lateral lappets (as from segment 2 in Fig. 22j) .... *Neoamphitrite*

Notosetae on more than 25 segments. Without lateral lappets .... *Terebella*

21 Without any setae .... *Hauchiella*†

With setae 22

22 Abdomen without uncini .... *Lysilla*

Abdomen with avicular uncini or needlelike setae, sometimes deeply imbedded 23

23 Abdominal setae avicular uncini (as in Fig. 23e) .... *Polycirrus*

Abdominal setae straight, needlelike .... *Amaeana*

24 Notosetae from segment 2 [uncini from segment 5] .... *Streblosoma*

Notosetae from segment 3 [uncini from segment 5] .... *Thelepus*

Amaeana Hartman

Notosetae on 12 [not 10] segments .... *A. occidentalis* (Hartman)
(See Hartman 1969; Banse 1980)

Amphitrite Müller

Prostomium without eyes. Nephridial papillae on segments 3 and 6–11 [not 6–8]; on latter segments inconspicuous, between notopodium and neuropodium. (See also Fig. 22a) .... *A. cirrata* Müller

Artacama Malmgren

As in generic key. (See also Fig. 22b) .... *A. conifera* Moore
The key does not differentiate this species from *A. proboscidea* Malmgren† recorded from the Arctic and the temperate NW Pacific Ocean (Ushakov 1955).

Betapista Banse

As in generic key. (See also Fig. 22c) .... *B. dekkerae* Banse
(See Banse 1980)

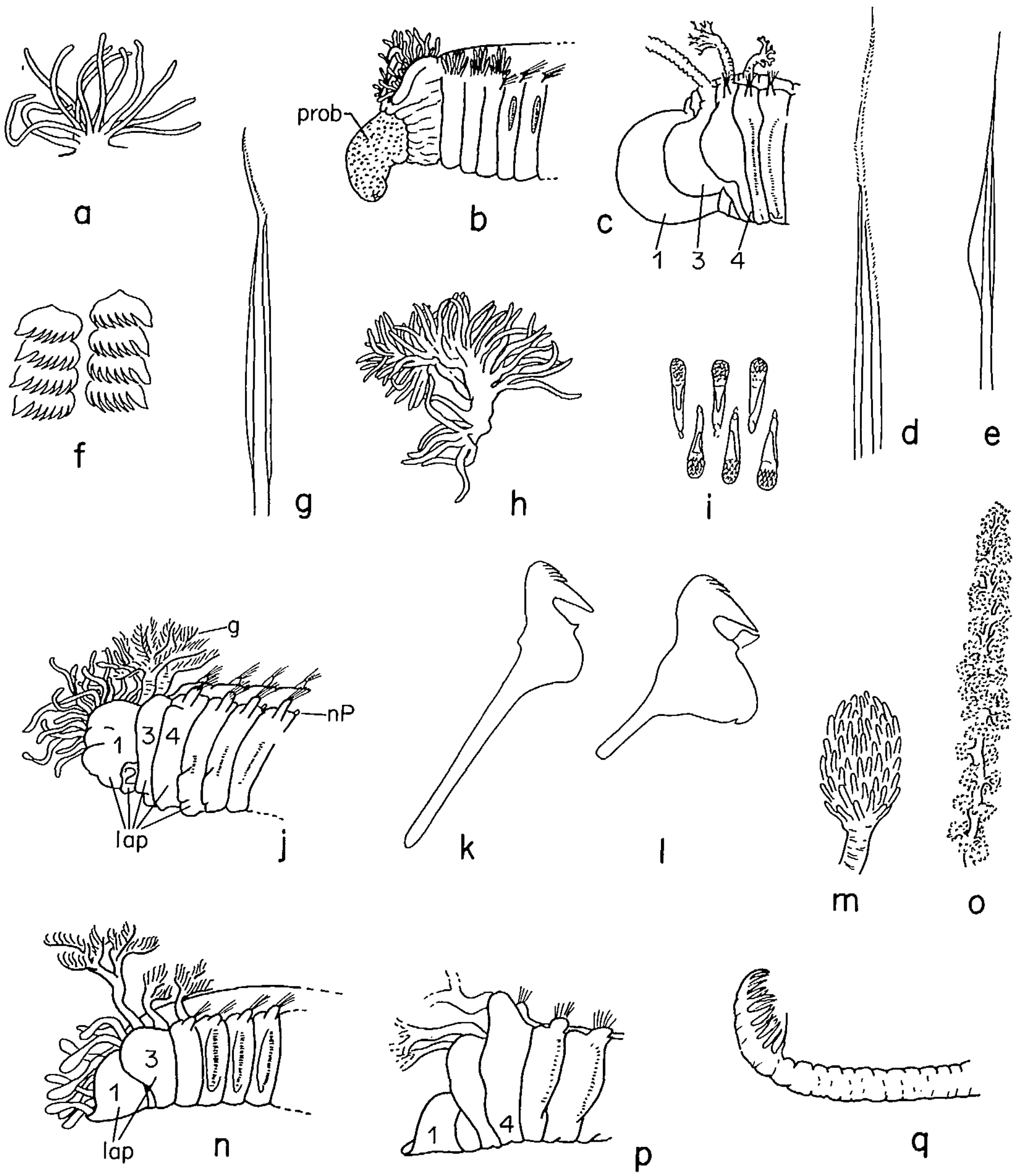


FIG. 22. TEREBELLIDAE [anterior ends in lateral views]: *Amphitrite cirrata*: a, gill. *Artacama conifera*: b, anterior end. *Betapista dekkerae*: c, anterior end [tentacles omitted, gills partially indicated]. *Lanassa venusta venusta*: d, denticulate tip of notoseta. *Leaena abranchiata**: e, limbate notoseta with smooth tip. *Loimia medusa**: f, thoracic pectinate uncini in parapodium, lateral view. *Neoamphitrite edwardsi*: g, limbate notoseta with denticulate tip. *N. robusta*: h, gill; i, posterior thoracic uncini in parapodium, frontal view. *Pista brevibranchiata*: j, anterior end; k, *l*, anterior and posterior thoracic avicular uncini, side view. *P. cristata*: m, gill. *P. elongata*: n, anterior end. *P. moorei*: o, part of gill. *P. pacifica*: p, anterior end [tentacles omitted, gills indicated]; q, tube, anterior end. Sources: a, o, p, CPF; b, d, j, m, n, original; c, Banse (1980); e, Ushakov (1955); f, Day (1967); g, Fauvel (1927); h, i, Johnson (1901); k, *l*, Banse and Hobson (1968); q, Berkeley and Berkeley (1942) [e, h, *l*, p, q, modified].

Eupolymnia Verrill

With 3 [not 6] nephridial papillae from segment 3. Width of lateral lappets half length of segments (as on segments 4–6, Fig. 22j). Gills branched serially [not dichotomously] (as in Fig. 22j) .... *E. heterobranchia* (Johnson)
(In CPF, see also BANSE 1980)

Lanassa Malmgren

Without eyes. Notosetae on 11 [not 12 or 15] setigers. Uncini in double row on posterior segments with notosetae, and on following 4 segments without notosetae. (See also Fig. 22d) .... *L. venusta venusta* (Malm)
(See USHAKOV 1955; BANSE 1980)

Laphania Malmgren

As in generic key .... *L. boecki* Malmgren
(See USHAKOV 1955; BANSE 1980)

Leaena Malmgren*

Notosetae on 10 segments, broad-limbate (Fig. 22e) ....
.... *L. abranchiata* (Malmgren)*
(See HARTMAN 1948; PEREYRA AND ALTON 1972)

Loimia Malmgren*

As in generic key. (See also Fig. 22f) .... *L. medusa* (Savigny)*
(See HARTMAN 1969; HARTMAN AND REISH 1950)

Lysilla Malmgren

With 6 pairs of notopodia; setae numerous, tapered, not emerging. Nephridial papillae below notopodia often as long as notopodia. Thorax with very numerous, large epidermal papillae .... *L. loveni* Malmgren
(See USHAKOV 1955; BANSE 1980)

Neoamphitrite Hessle

1 Notosetae on 19 segments. Uncini in single row from abdominal segment 2
.... *N. groenlandica* (Malmgren)*
(See PETTIBONE 1954; PEREYRA AND ALTON 1972 [*Amphitrite groenlandica* in both])

Notosetae on 17 segments 2

2 Terminal branches of gills relatively long (Fig. 22h). Ventral shields on last 6 [8] thoracic setigers inconspicuous. Nephridial papillae on 12 [at least 10] segments, from segment 3. (See also Fig. 22i) .... *N. robusta* (Johnson)

(In CPF, see also BANSE 1980)

There may be two varieties (see *Terebella robusta* Johnson in BERKELEY 1929).

Terminal branches of gills relatively short. Nephridial papillae on 9 [not 4] segments, from segment 3. (See also Fig. 22g) .... *N. edwardsi* (Quatrefages)

(See BANSE AND HOBSON 1968)

Neoleprea Hessle

1 Abdominal uncini in double row .... *N. californica* (Moore)*

(See BANSE 1980)

Abdominal uncini in single row 2

2 Notosetae on about 25 segments. With about 15 ventral shields .... *N. japonica* Hessle

(See BANSE 1980)

Notosetae on about 35 [40] segments. With about 20 ventral shields .... *N. spiralis* (Johnson)

Nicolea Malmgren

Notosetae on 15 setigers .... *N. zostericola* (Oersted)

FAUVEL (1927) noted the variability within the species and characterized the related *N. venustula* (Montagu)†. Mature, 1.0–1.5 cm long specimens collected by J. Bryan in plankton nearshore at San Juan Island, Washington, in summer 1978, and referred to *N. zostericola* by K. Banse have notosetae on 15 setigers as in *N. zostericola;* the basal stems of their gills are long, similar to those of *N. venustula*†, rather than short as in *N. zostericola* (see also REISH 1965 for comments on *N. zostericola* from Bering Strait).

Pista Malmgren

Listed species possess notosetae on 17 segments. Paired gills may be very unequal in size; occasionally one may be missing.
P. fratrella [not Chamberlin] in CPF is not included here (see *Pista* sp. I, in Banse 1980).

1 Gills long and trailing, with well-separated groups of short branches (Fig. 22o) .... *P. moorei* Berkeley and Berkeley

Gills otherwise 2

2 With 2 [or 1] pairs of clublike or arborescent gills. Tube with wall of mud or sand 3

With 3 pairs of clearly arborescent gills. Tube membranous [often with shell fragments] 4

3 Gills with filaments in dense, clublike tufts [or arranged in compressed spiral], stem usually long (Fig. 22m). Lateral lappets large on segments 2 and 3 (often also on 1), absent after segment 4 .... *P. cristata* (Müller)
(In CPF, see also BANSE 1980)

Gills arborescent. Lateral lappets large on segments 1 and 3, less developed on segment 4, short on next 2 or 3 segments (Fig. 22j). Dorsal surface of segment 3 lower than that of segment 4. Posterior thoracic uncini with long handles (Fig. 22k, *l*) .... *P. brevibranchiata* Moore
(*P. fasciata* [not Grube] in CPF, see BANSE 1980)

4 Lappets ventrolateral on segment 1, lateral on segment 3 (Fig. 22n). Posterior thoracic uncini with reduced handles. Anterior end of tube sponge-like with many branched filaments covered with fine shell fragments .... *P. elongata* Moore

Lappets ventrolateral on segment 1, lateral on segments 3 and 4 (Fig. 22p). Posterior thoracic uncini with long handles (as in Fig. 22k). Anterior end of tube with hood bordered by [essentially unbranched] filaments (Fig. 22q) .... *P. pacifica* Berkeley and Berkeley

Polycirrus Grube

Identification of the members of the genus is very difficult. Further the genus is in need of revision so that only preliminary diagnoses exist for five of the listed species (Banse 1980); hence, the provisional designation of the taxa.
Use method on p. 5 for viewing uncini in frontal view. Lateral shields occupying the position of the neuropodia in the thorax are similar in structure to the ventral shields (as in Table 5, fig. B).
Polycirrus eous Annenkova† with 20 notopodia is not differentiated clearly here (see Annenkova-Chlopina 1924; Ushakov 1955).

1 Notosetae mainly plumose (Fig. 23d); some limbate. With 10–14 pairs of notopodia [rarely 15] .... *Polycirrus* sp. I
(*Lysilla pacifica* [not Hessle] in BANSE AND NICHOLS 1968, see BANSE 1980)

Notosetae limbate [may appear under oil immersion lens as weakly serrate as in Fig. 23g, or with fine hairs] 2

2 With 10–15 pairs of notopodia 3

With 20–25 [40] pairs of notopodia 5

3 Notosetae weakly serrate (Fig. 23g [serration may appear only on one side of seta]). Uncinus with semicircle of large teeth above secondary tooth (Fig. 23h) .... *Polycirrus* sp. III
(*Polycirrus kerguelensis* [not McIntosh] in CPF, see BANSE 1980)

Notosetae with fine hairs (as in Fig. 23j) 4

4 Uncinus with 0 to 3 smaller teeth above secondary tooth (Fig. 23e, f). Paired lateral shields on about 6 [not about 10] segments .... *Polycirrus* sp. II
(*Polycirrus medusa* [not Grube] in PETTIBONE 1954, see BANSE 1980)

Uncinus with numerous small teeth above and to side of secondary tooth (Fig. 23k). Paired lateral shields on 6–8 segments. (See also Fig. 23j) .... *Polycirrus* sp. V
(See BANSE 1980)

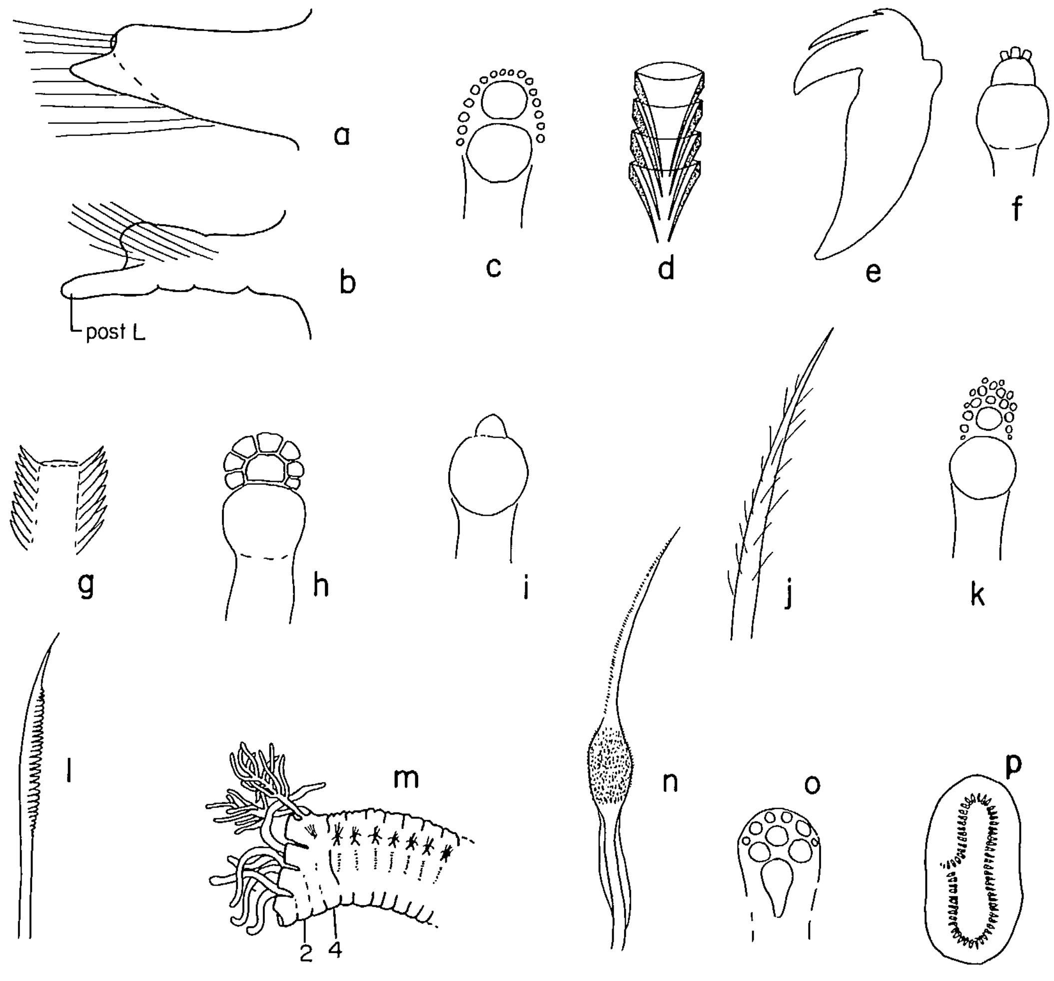


FIG. 23. TEREBELLIDAE [frontal views of uncini sketched]. *Polycirrus californicus*: a, anterior notopodium, posterior view; b, posterior notopodium, dorsal view [setae schematic in both]; c, crest of uncinus, frontal view. *Polycirrus* sp. I: d, middle part of plumose notoseta. *Polycirrus* sp. II: e, avicular uncinus, lateral view; f, crest of uncinus, frontal view. *Polycirrus* sp. III: g, middle part of limbate notoseta; h, crest of uncinus, frontal view. *Polycirrus* sp. IV: i, crest of uncinus, frontal view. *Polycirrus* sp. V: j, tip of notoseta; k, crest of uncinus, frontal view. *Proclea graffii*: *l*, comblike notoseta. *Scionella japonica*: m, anterior end, lateral view. *Spinosphaera*† sp.: n, long notoseta. *Streblosoma bairdi*: o, crest of abdominal uncinus, frontal view. *Thelepus crispus*: p, abdominal neuropodium. Sources: a–k, Banse (1980); *l*, n, Hessle (1917); m, p, CPF; o, original [a, b, e, *l*, m, p, modified].

5 Notopodium with usually conspicuous posterior lobe (Fig. 23a, b). Uncinus with semicircle of small teeth above secondary tooth (Fig. 23c) .... *P. californicus* Moore

(*P. perplexus* Moore in WEESE 1933; *P. caliendrum* [not Claparède] in part, in CPF, see BANSE 1980)

Notopodium without conspicuous posterior lobe. Uncinus without teeth above 1 or 2 small teeth above principal tooth (Fig. 23i) .... *Polycirrus* sp. IV

(See BANSE 1980)

Proclea St.-Joseph

Notosetae on 16 [not 20–23] setigers. Uncini on abdominal segment 1 in single row (see also Fig. 23*l*) .... *P. graffii* (Langerhans)

(See USHAKOV 1955; BANSE AND HOBSON 1968)

Scionella Moore

1 Gills on segment 2, bottle-brush shaped [with densely packed whorls] .... *S. estevanica* Berkeley and Berkeley

Gills on segment 4, otherwise (Fig. 23m) .... *S. japonica* Moore

(In CPF, see also BANSE AND HOBSON 1968)

Streblosoma Sars

Posterior [middle abdomen] uncini with at least 4 or 5 smaller teeth above 3 secondary teeth (Fig. 23o) .... *S. bairdi* (Malmgren)

Terebella Linnaeus

Notosetae absent from last 30–40 segments. With about 13 ventral shields .... *T. ehrenbergi* Grube

Thelepus Leuckart

Records of *T. triserialis* (Grube) by Berkeley (1929) and Berkeley and Berkeley (1932b) from British Columbia should be considered as erroneous (C. Berkeley, personal communication).

1 With 2 pairs of gills [setiger 2 without gills] 2

With 3 pairs of gills [setiger 2 with gills] 3

2 First 4 thoracic segments glandular ventrally and laterally, similar to following segments. Ventral shields indistinct .... *T. cincinnatus* (Fabricius)

(See FAUVEL 1927; *T. hamatus* [not Moore] in CPF, see BERKELEY 1968)

First 4 thoracic segments fully encircled by thick glandular layer, following segments glandular only ventrally and laterally .... *T. hamatus* Moore*

(See HARTMAN 1969; not *T. hamatus* in CPF, see BERKELEY 1968)

3 Uncini in flattened ring from segment 8 (Fig. 23p) .... *T. crispus* Johnson

Uncini in amost straight row throughout. Gills not unusually short (similar to Fig. 22a, or longer) 4

4 Notosetae absent from about last 40 [possibly 80] segments. Gill filaments usually slender .... *T.˙ setosus* (Quatrefages)

Notosetae absent from about last 10 segments. Gill filaments usually coiled .... *T. japonicus* Marenzeller

(See IMAJIMA AND HARTMAN 1964; doubtful record in BANSE ET AL. 1968)

The key does not clearly distinguish this species from *T. plagiostoma* (Schmarda)† which is widely distributed elsewhere, including the Sea of Okhotsk. *T. japonicus* and *T. setosus* were regarded as synonyms of *T. plagiostoma*† by HESSLE (1917) and USHAKOV (1955), whereas FAUVEL (1927) considered only *T. setosus* as synonymous with *T. plagiostoma*†. We follow IMAJIMA AND HARTMAN (1964) who recognized *japonicus* and *plagiostoma* as valid species.

TRICHOBRANCHIDAE

Table 5, fig. C; Fig. 24

HESSLE (1917); USHAKOV (1955)

The family was not recognized in CPF: *Terebellides* and *Trichobranchus* were included in the Terebellidae. The external morphology is similar to that of the Terebellidae except that ventral shields are absent. The principal external diagnostic character on the family level is provided by the thoracic neurosetae which may be acicular uncini (as in Table 5, fig. C [not as in Fig. 22k]) or spines (as in Fig. 24d [on 1st thoracic neuropodium]).

1 With single, middorsal gill (as in Fig. 24c [sometimes as in Table 5, fig. C]). All tentacles of one kind .... *Terebellides*

With 2–4 pairs of gills. Tentacles of two kinds: long, threadlike and short, heavy 2

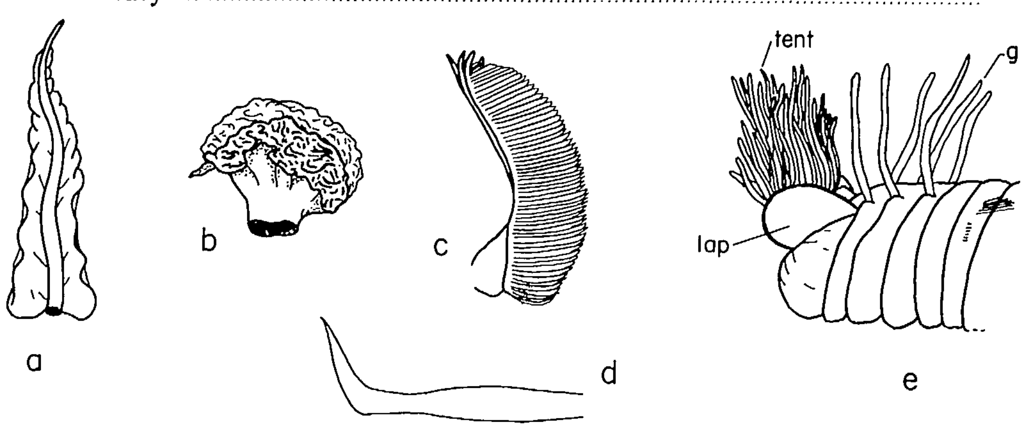


FIG. 24. TRICHOBRANCHIDAE: *Novobranchus pacificus*: a, gill of segment 3; b, gill of segment 5. *Terebellides stroemi*: c, gill; d, spine of thoracic neuropodium 1. *Trichobranchus glacialis*: e, anterior end, lateral view. Sources: a, b, Berkeley and Berkeley (1954); c–e, original [b, modified].

2 Gills on 4 segments, lanceolate (as in Fig. 24a) anteriorly and rosettelike (as in Fig. 24b) posteriorly [at least on 4th gillbearing segment] .... *Novobranchus*

Gills on 2 or 3 segments, simple filiform. Origin of tentacles partly covered by lateral lappets on 1st segment (as in Fig. 24e) .... *Trichobranchus*

Novobranchus Berkeley and Berkeley

As in generic key. (See also Fig. 24a, b) .... *N. pacificus* Berkeley and Berkeley
(See BERKELEY AND BERKELEY 1954)

Terebellides Sars

Gills with four branches nearly fused, with common origin [not serially arranged] on thick stem (Fig. 24c). Spines of 1st thoracic neuropodium [setiger 6] bent, with straight [not recurved] tips (Fig. 24d) .... *T. stroemi* Sars

The key does not distinguish this species from *T. moori* Hessle†, 1917 which was based on the Alaskan form of *T. stroemi* of MOORE (1908).

Trichobranchus Malmgren

With 3 pairs of gills (Fig. 24e) .... *T. glacialis* Malmgren

Figure 155 in CPF shows thoracic neuropodial uncini with hoods which have not been noted by others.

SABELLIDAE

Table 5, fig. E; Fig. 25, 26
JOHANSSON (1927); BANSE (1957)

The tentacular crown ["gills"; mainly a feeding organ] consists of a pair of lobes (as in Fig. 25a, 26n), each with [usually numerous] radioles. Typically, each radiole carries many secondary branches [pinnules] on the inner side; sometimes radioles at dorsal and ventral ends of the lobes lack pinnules (as in Fig. 25s, 26d). Radioles may on their outer side bear eyes that usually protrude and/or eyespots in or below the epidermis [pigment may fade in preservative]. The radioles may be connected to varying heights by a thin membrane (as in Fig. 26c) that is often difficult to see. In animals fixed in their tubes, the entire tentacular crown may appear twisted around the longitudinal axis. The diagnostic character "crown spirally coiled" refers, however, to the ventral part of the base of each lobe which usually can be seen only by pulling the radioles gently apart (cf. Fig. 25a [coiled] and Fig. 26n [semicircular]). The character "coiled" indicates that the ventral base of the tentacular lobe has taken at least a half (180°) turn [usually a few full turns]. Note that in the semicircular arrangement, a few radioles may be turned to the inside at both ends of the tentacular lobe.

The thorax normally has 8 setigers; deviations usually do not constitute a diagnostic character. Look for diagnostic characters of thoracic setae only from setiger 2 onward, unless setiger 1 is named. Note that subspatulate setae (as in Fig. 26g) occasionally may appear in side view similar to knifelike setae (see Fig. 26p).

1 Anterior [5 or 6] thoracic neuropodia with avicular uncini (as in Fig. 25t, 26j), with or without pennoned (pickax-shaped) setae (as in Fig. 25b) [excepting *Potamethus*†, with long-handled uncini (as in Fig. 25p) and pennoned setae]. SABELLINAE 2

Anterior thoracic neuropodia with long-handled uncini (as in Fig. 25p), without pennoned setae 13

2 Anterior thoracic neuropodia with long-handled uncini and pennoned setae .... *Potamethus*†

Anterior thoracic neuropodia with avicular uncini, with or without pennoned setae 3

3 All thoracic neuropodia with only avicular uncini 4

All thoracic neuropodia with avicular uncini and pennoned setae 6

4 Thoracic notopodia with limbate (as in Fig. 26e) and spatulate setae (as in Fig. 25g). Uncini with broad bases (similar to Fig. 25h) .... *Laonome*

Thoracic notopodia with only limbate setae [may be subspatulate in *Sabellastarte*]. Uncini with S-shaped bases (as in Fig. 25t) 5

5 Radioles with paired appendices on outer side [opposite pinnules] (as in Fig. 25c) .... *Branchiomma*†

Radioles without appendages on outer side .... *Sabellastarte*

6 Some or all radioles with subdistal eyes (as in Fig. 26b). Thoracic notopodia with only limbate setae in adults; also with spatulate (as in Fig. 25g) or subspatulate (as in Fig. 26g) setae in juveniles .... *Megalomma*

Radioles without subdistal eyes 7

7 Collar reduced to 2 conical ventral lobes. Adult worms up to 2 cm long .... *Amphiglena*†

Collar at least ventrally and laterally well developed. Adult worms more than 2 cm long 8

8 Setae of setiger 1 in slanted row. Abdominal neurosetae limbate and spatulate .... *Hypsicomus*†

Setae of setiger 1 in tuft (as in Fig. 26n). Abdominal neurosetae only limbate 9

9 All [except few unbranched in small specimens] radioles dichotomously branched (as in Fig. 26q); tentacular lobes semicircular in cross section (as in Fig. 26n) .... *Schizobranchia*

All radioles unbranched [except several in *Eudistylia vancouveri*]; tentacular lobes spirally coiled (as in Fig. 25a [usually 2 to 3 turns]) or semicircular in cross section 10

10 With high, transverse wavy ridge on dorsal surface of posterior abdominal segments, in center on midabdomen, extending across dorsal surface posteriorly. Tentacular lobes spirally coiled [about 1¼ turns] .... *Distylidia*†

Without transverse ridges on abdomen [in contracted animals, entire mid-abdominal segments may appear ridged but not wavy]. Tentacular lobes spirally coiled or semicircular 11

11 Tentacular lobes spirally coiled [see note on p. 103]. Thoracic notopodia with limbate and spatulate (as in Fig. 25g) setae .... *Eudistylia*

Tentacular lobes semicircular. Thoracic notopodia with limbate, with or without subspatulate (as in Fig. 26g), knifelike (as in Fig. 26p), or spatulate setae 12

12 Thoracic notopodia with limbate and spatulate (as in Fig. 25g) setae .... *Potamilla*

Thoracic notopodia with limbate, with or without subspatulate (as in Fig. 26g) or knifelike (as in Fig. 26p) setae .... *Sabella*

13 Abdominal uncini in long rows, almost encircling body. With very pronounced membrane connecting radioles (as in Fig. 26c). MYXICOLINAE .... *Myxicola*

Abdominal uncini in short rows. With or without membrane connecting radioles. FABRICIINAE 14

14 With ventral anal furrow (as in Fig. 25k) of variable length .... *Euchone*

Without anal furrow 15

15 With 3 abdominal setigers; abdominal uncini brushlike with long, straight handles (as in Fig. 25q). Worms much shorter than 1 cm 16

With usually more than 3 abdominal setigers; abdominal uncini without long, straight handles [examine anterior abdominal segments]. Worms of variable but usually moderate length 18

16 Tentacular crown with conspicuous [at least in life] pair of ventral filaments, each with blood vessel (as in Fig. 26a [green in life, usually brownish in preserved specimens]) and 2 pairs of radioles; each radiole with 2 (as in Fig. 26a) or several pinnules. Pygidium without eyespots .... *Manayunkia*

Tentacular crown with 3 pairs of radioles with many pinnules (as in Fig. 25s [1 pair of radioles not shown]). Pygidium with eyespots [at least in life] 17

17 Collar high also on dorsal side (as in Fig. 25r). Tentacular crown with ventral pair of [unbranched] filaments, as long as radioles (as in Fig. 25s), without conspicuous blood vessel [used like palps; difficult to see in preserved material] .... *Fabriciola*

Collar essentially only a ventral lip (as in Fig. 25n, o). Tentacular crown without pair of long ventral filaments .... *Fabricia*

18 Abdominal uncini S-shaped, middle part longer than wide (as in Fig. 25t). Radioles not connected by membrane. With postsetal glandular [whitish] ring on setiger 2 (as in Fig. 25i) .... *Jasmineira*

Abdominal uncini with broad bases (as in Fig. 25e, h; 26f [study anterior segments]) 19

19 With postsetal glandular [whitish] ring on setiger 2. Radioles connected by membrane (as in Fig. 26c [or only to ¼ of their length]). Anterior abdominal uncini with bases similar to Fig. 25e, h. Adult worms usually more than 1 cm long .... *Chone*

Without postsetal glandular ring on setiger 2. Radioles not connected by membrane, but with a flange (as in Fig. 26d). All abdominal uncini with bases similar to Fig. 26f. Adult worms less than 1 cm long .... *Oriopsis*

Chone Kröyer

The collar of the listed species lacks a midventral notch. Tips of the thoracic, spatulate notosetae often are broken off; thus, several notopodia should be examined. Light-colored pads of glandular cells occupying the ventral side of the body are called ventral shields.

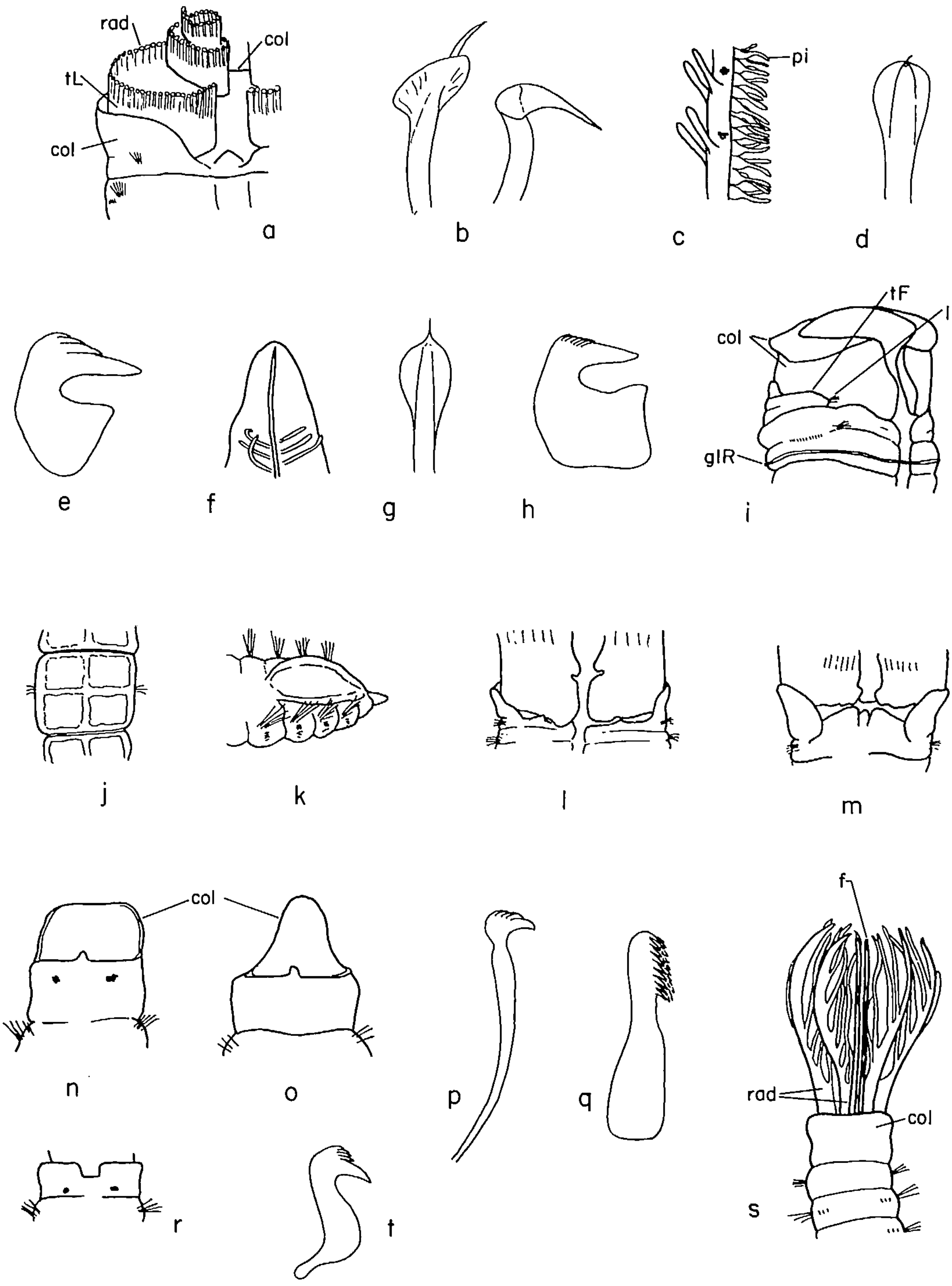
Small species may be identified from the distribution of mucus cells on the body. Immerse specimens for a few minutes in a very dark solution of methyl green in 70–80% ethyl alcohol with water, then differentiate for 5–20 min in 70–80% alcohol. See Banse (1972b) for patterns.

1 With ventral shields [sometimes weakly developed]. With 6–8 pairs of radioles, tips varying in length. Spatulate setae with long tips (as in Fig 25g). Worms up to 1.5 cm long .... *C. ecaudata* (Moore)

(*C. gracilis* [not Moore], in part, in CPF, see Banse 1972b)

Without ventral shields, with glandularized epidermis encircling entire thorax. Large worms 2

Fig. 25. SABELLIDAE: a, schematic dorsal view of anterior end [tentacular crown cut off, left tentacular lobe largely omitted]; b, pennoned seta [two views]. *Branchiomma*† sp.: c, appendices and pinnules on radiole. *Chone aurantiaca*: d, thoracic spatulate seta; e, abdominal uncinus. *C. infundibuliformis*: f, tip of radiole; g, thoracic spatulate seta; h, abdominal uncinus. *C. mollis**: i, anterior end, dorsolateral view [tentacular crown omitted]. *Euchone analis*: j, ventral shields of abdominal segment [schematic]. *E. incolor*: k, posterior end, ventrolateral view. *Eudistylia polymorpha*: *l*, collar and edges of dorsal bases of tentacular lobes. *E. vancouveri*: m, collar and edges of dorsal bases of tentacular lobes. *Fabricia oregonica*: n, anterior end, dorsal view [tentacular crown omitted]. *F. sabella*: o, anterior end, dorsal view [tentacular crown omitted]; p, thoracic long-handled uncinus; q, abdominal brushlike uncinus. *Fabriciola berkeleyi*: r, anterior end, dorsal view [tentacular crown omitted]; s, anterior end, ventral view. *Jasmineira* sp.: t, abdominal avicular uncinus. Sources: a, b, j, o, r, original; c, t, Fauvel (1927); d–i, Banse (1972b); k, Reish (1965); *l*, m, Banse (1979c); n, Banse (1963); p, q, Banse (1956); s, Hartman (1969) [f, k, n, q, s, modified].



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2 Free ends [beyond pinnules] of lateral radioles short, broad (as in Fig. 25f) 3

Free ends of lateral radioles long or very long. Usually, collar clearly longer ventrally than laterally 4

3 Spatulate setae with long pointed tips (Fig. 25g). Setal tuft typically inserted more dorsally on setiger 1 than on 2, of about the same size. Abdominal uncini with fine teeth above rostrum (Fig. 25h). (See also Fig. 25f) .... *C. infundibuliformis* Kröyer
(In CPF, see also BANSE 1972b)

Spatulate setae without pointed tips, sometimes with fine single hairs distally (Fig. 25d). Setal tuft on setiger 1 inserted at same level as following notopodia, small. Abdominal uncini with a few coarse teeth above rostrum (Fig. 25e) .... *C. aurantiaca* (Johnson)
(See BANSE 1972b)

4 Setal tuft on setiger 1 inserted in short longitudinal furrow [continuation of anterior segmental border of setiger 1] extending to anterior border of setiger 2 (Fig. 25i) .... *C. mollis* (Bush)*
(See BANSE 1972b; HARTMAN AND REISH 1950)

Setal tuft on setiger 1 inserted in collar (as in Fig. 26h [not in a long transverse furrow]) 5

5 Spatulate setae without pointed tips (as in Fig. 25d [sometimes with fine single hairs distally]) .... *C. magna* (Moore)
(See BANSE 1972b)

Spatulate setae with long pointed tips (as in Fig. 25g) .... *C. duneri* Malmgren
(*C. bimaculata* Banse and Nichols, 1968, see BANSE 1972b)

Euchone Malmgren

Listed species have a well-developed collar of about equal height dorsally and ventrally, without a deep midventral incision.

1 With 34–40 setigers. Anal depression involving 9–12 setigers. With 10–15 pairs of radioles with pinnules. Anterior abdominal segments with 2 pairs of ventral, almost rectangular glandular areas close together (Fig. 25j [not round and separated by wide spaces into anterior and posterior pairs]) .... *E. analis* (Kröyer)
(In CPF, see also BANSE 1972b)

With 16 or 17 setigers. Anal depression involving 3 setigers (as in Fig. 25k). With 3 or 4 pairs of radioles with pinnules 2

2 With 9 abdominal setigers. Intermediate length thoracic notosetae subspatulate [mount animals]. (See also Fig. 25k) .... *E. incolor* Hartman
(See BANSE 1970)

With 8 abdominal setigers. Intermediate-length thoracic notosetae limbate [like long setae] .... *E. hancocki* Banse*
(See BANSE 1970; questionable record from off Oregon in BANSE 1979c)

Eudistylia Bush

The tentacular lobes of juveniles (body length 10 cm) of *Eudistylia* spp. that have just started to coil may be confused with those of *Potamilla* spp. Examine the basal part of the lobes which in *Eudistylia* juveniles is already raised and rotated about 90°. Also the tentacular lobes of adult *Potamilla myriops* are ventrally turned inward.

1 Notopodia [with uncini] of first abdominal segments clearly shorter than tori of posterior thoracic segments .... *E. catharinae* Banse
(*E. polymorpha*, in part, in CPF, see BANSE 1979c)

Notopodia of first abdominal segments longer than tori of posterior thoracic segments 2

2 Dorsal edges of tentacular lobes proximally flared, turned away from body; longitudinal edges clearly cleft (Fig. 25*l*) .... *E. polymorpha* (Johnson)
(*E. polymorpha*, in part, in CPF, see BANSE 1979c)

Dorsal [longitudinal] edges of tentacular lobes nearly straight, not cleft (Fig. 25m) .... *E. vancouveri* (Kinberg)
(In CPF, see also BANSE 1979c)

Fabricia Blainville

1 Collar with squarish outline (Fig. 25n). Short thoracic notosetae subspatulate (as in Fig. 26g) .... *F. oregonica* Banse
(See BANSE 1979c)

Collar with round outline (Fig. 25o). Short thoracic notosetae spatulate (as in Fig. 25g). (See also Fig. 25p, q) .... *F. sabella* (Ehrenberg)

Fabriciola Friedrich

Collar with middorsal gap (Fig. 25r). Radioles without flanges [not as in Fig. 26d]. (See also Fig. 25s) .... *F. berkeleyi* Banse
(See *Fabricia berkeleyi* in HARTMAN 1969; *Fabricia pacifica* [not Annenkova] in CPF)
The key does not distinguish this species from *Fabricia pacifica* Annenkova† from the Bering Sea.

Jasmineira Langerhans

Collar ventrally broadly protruding, incised midventrally. Pygidium with small appendix .... *J. pacifica* Annenkova
(See BANSE 1979c)

Laonome Malmgren

Collar with broad middorsal gap [similar to Fig. 26n] .... *L. kroyeri* Malmgren
(See BANSE 1963)

Manayunkia Leidy

1 Tentacular crown with 4 pairs of pinnules [note ventral pairs of filaments] (Fig. 26a) .... *M. aestuarina* (Bourne)
(See LIGHT 1969)

Tentacular crown with 10 or more pairs of pinnules. Principally in fresh water .... *M. speciosa* Leidy*
(See PETTIBONE 1953, MACKIE AND QADRI 1971)

Megalomma Johansson

Branchiomma Claparède (nom. praeoccup.) in CPF. This genus differs from *Branchiomma* Köllikerf.

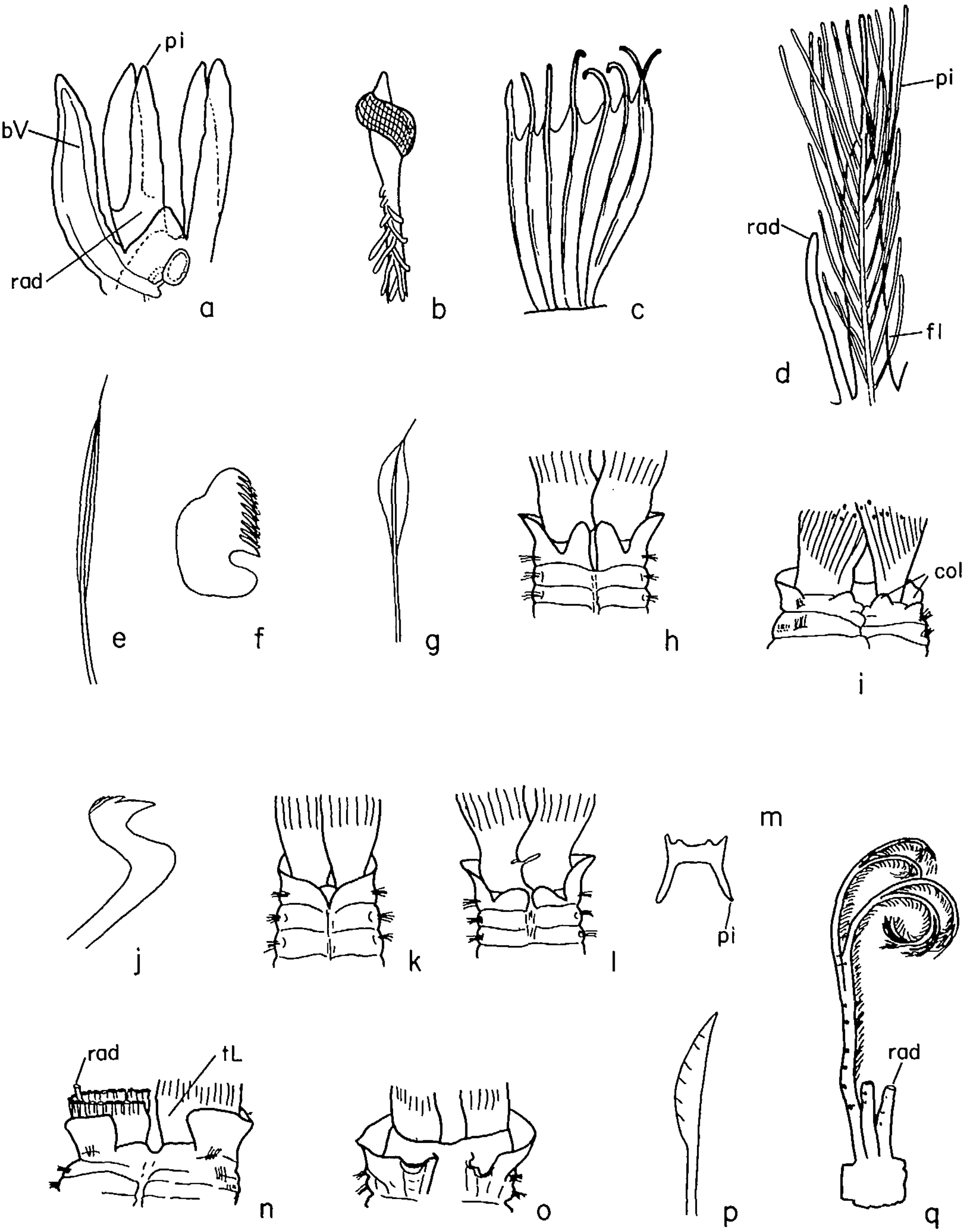
Collar with ventrolateral incision. Subdistal eyes only on some dorsal radioles, spiraled (Fig. 26b) .... *M. splendida* (Moore)
(*Branchiomma burrardum* Berkeley in CPF, see FAUCHALD 1972)

Myxicola Koch

1 With 1–4 thoracic setigers. (See also Fig. 26c) .... *M. aesthetica* (Claparède)

With 8 or 9 thoracic setigers .... *M. infundibulum* (Renier)
(In CPF, see also BERKELEY 1972)

FIG. 26. SABELLIDAE: *Manayunkia aestuarina*: a, right tentacular lobe [from the inner side]. *Megalomma splendida*: b, tip of radiole, with eye. *Myxicola aesthetica*: c, tentacular lobe. *Oriopsis* sp. [schematic]: d, typical radiole, and radiole without pinnules; e, thoracic limbate seta; f, abdominal uncinus. *O. minuta*: g, thoracic subspatulate seta. *Potamilla intermedia*: h, anterior end, dorsal view [tentacular crown cut off]. *P. myriops*: i, anterior end, dorsal view [tentacular crown cut off]; j, thoracic avicular uncinus. *P. neglecta*: k, anterior end, dorsal view [tentacular crown cut off]. *P. occelata*: *l*, anterior end, dorsal view [tentacular crown cut off]. *Sabella crassicornis*: m, cross section of radiole. *S. media*: n, anterior end, dorsal view [tentacular crown cut off, palps omitted]. *S. pacifica*: o, anterior end, dorsal view [tentacular crown cut off]; p, lower thoracic knifelike seta. *Schizobranchia insignis*: q, radioles. Sources: a, Banse (1956); b, h, k, *l*, m, q, CPF; c, Fauvel (1927); d, Banse (1957); e, f, original; g, Berkeley and Berkeley (1932b); i, j, Banse and Hobson (1968); n–p, Banse (1979c) [c, d, g, j, m–p, modified].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Oriopsis Caullery and Mesnil

Listed species have 2 or 3 pairs of radioles and 3–7 abdominal setigers.

1 With limbate (as in Fig. 26e) and subspatulate (Fig. 26g) thoracic notosetae .... *O. minuta* (Berkeley and Berkeley)
(*Fabricia minuta* in CPF, see also BANSE 1979c)

With only limbate thoracic notosetae .... *O. gracilis* Hartman
(See HARTMAN 1969, BANSE 1979c)

Potamilla Malmgren

Pseudopotamilla Bush is included in this genus (See Banse 1972b:479)
See note under *Eudistylia* (p. 103).

1 Collar without dorsolateral incision or gap (as in Fig. 26k), low [not fully concealing peristomium], nearly contiguous dorsally, not forming pair of thick pads (Fig. 26k). Radioles [on outside], segment 1, and pygidium without eyes .... *P. neglecta* (Sars)

Collar with dorsolateral incision or gap (as in Fig. 26h, i) 2

2 Dorsal [longitudinal] tentacular edges of lobes cleft (Fig. 26*l*). Dorsal radioles each with 5–10, or more, eyespots on outside .... *P. occelata* Moore
(*Pseudopotamilla occelata* in CPF)

Dorsal edges of tentacular lobes not cleft, straight (as in Fig. 26k), or nearly so. Radioles usually with eyes on outside. Without eyespots at bases of thoracic notopodia 3

3 Dorsal lobes of collar low, each separated from lateral part by wide gap (Fig. 26i). Each radiole with more than 10 eyespots. (See also Fig. 26j and note on p. 103) .... *P. myriops* Marenzeller
(See BANSE AND HOBSON 1968)

Dorsal lobes of collar high, each separated from lateral part by rather narrow gap (Fig. 26h). Radioles with few, or no, eyespots. Handles of uncini in last 2 or 3 thoracic neuropodia almost twice length of those in anterior setigers .... *P. intermedia* Moore
(*Pseudopotamilla reniformis* [not Linnaeus] in CPF,
see also HARTMAN 1938b, BERKELEY AND BERKELEY 1942).
Moore (1905) described a slight notch [cleft] on the dorsal edge of the branchial lobe.

Sabella Linnaeus

Demonax Kinberg is considered here as a subgenus.

1 Collar with lateral incision, varying from slight to deep. All thoracic notosetae limbate. Subgenus *Sabella.*
Lateral incision distinct but shallow. Outer side of radioles winged over entire length (Fig. 26m), usually with eyespots; free ends [beyond pinnules] typically very short .... *S. crassicornis* Sars

Collar without lateral incision [but deep pockets in *S. pacifica,* Fig. 26o]. Short thoracic notosetae subspatulate or knifelike (as in Fig. 26g, p). Subgenus *Demonax* 2

2 Collar arising dorsad, or at the level of setae of setiger 1, with wide middorsal gap (Fig. 26n). Short thoracic notosetae subspatulate (as in Fig. 26g). Radioles without eyes but with many spots of brown or yellow pigment [may fade in preservative] .... *S. media* (Bush)
(*Demonax medius* and *Distylia rugosa* [not Moore], in CPF, see BANSE 1979c)

Collar middorsally with narrow gap; each lobe with pockets (Fig. 26o). Short thoracic notosetae knifelike (Fig. 26p). Radioles with eyes on outer side [?] .... *S. pacifica* (Berkeley and Berkeley)
(See BANSE 1979c)

Sabellastarte Savigny

An unidentifiable *Sabellastarte* sp. was recorded from the Strait of Juan de Fuca (Banse 1979c).

Schizobranchia Bush

Radioles dichotomously branched, up to 4 or 5 times in large individuals (body length, without tentacular crown, 10–15 cm) (Fig. 26q) .... *S. insignis* Bush

SERPULIDAE

Table 5, fig. G; Fig. 27, 28
USHAKOV (1955)

As in the Sabellidae, the tentacular crown consists of a pair of lobes, each with usually numerous radioles bearing shorter secondary branches [pinnules] on the inner side (as in Table 5, fig. G). Usually one [rarely 2] radiole is transformed into an operculum (as in Fig. 27c) that plugs the entrance to the tube when the worm withdraws; it is sometimes used for brooding eggs (as in Fig. 28i). The membranous collar (see Table 5, fig. G) usually bears an anterior bundle of special setae (collar setae) which may differ greatly in size and shape; blades of heavy setae may have large proximal teeth somewhat separated from the others (fin, as in Fig. 27m, n).
The revision by Uchida (1978) was received too late to be considered.

1 With fewer than 5 thoracic setigers. Body asymmetrical. SPIRORBINAE.
This taxon is regarded by several recent authors (e.g., KNIGHT-JONES ET AL. 1980) as a family.
Tube small, spirally coiled (as in Fig. 28m) .... *Spirorbis*

With at least 5 thoracic setigers. Body symmetrical 2

2 Operculum absent, or at tip of unmodified [with pinnules] radiole (as in Fig. 27c). FILOGRANINAE 3

Operculum present, at tip of modified [without pinnules] radiole (as in Fig. 27d). SERPULINAE 5

3 Without operculum. Collar setae with fin (as in Fig. 27n) .... *Salmacina*

With or without operculum. Collar setae without fin (as in Fig. 27k) 4

4 Operculum globular (as in Fig. 27c), transparent .... *Apomatus*

Operculum absent .... *Protula*

5 Collar setae absent [setiger 1 with uncini] 6

Collar setae present (as in Table 5, fig. G [may be very small; setiger 1 without uncini]) 7

6 Opercular stalk not winged (similar to Fig. 27g), smooth .... *Placostegus*†

Opercular stalk winged (similar to Fig. 28a) .... *Pomatoleios*†

7 Blades of heavy collar setae with 2 or more large proximal teeth (as in Fig. 27m, p) 8

Blades of all collar setae without large teeth or fin (as in Fig. 27h, 28b) 11

8 Operculum double, with crown of spines projecting from middle of funnel-shaped proximal part (as in Fig. 27f) .... *Hydroides*†

Operculum single (as in Fig. 27d) 9

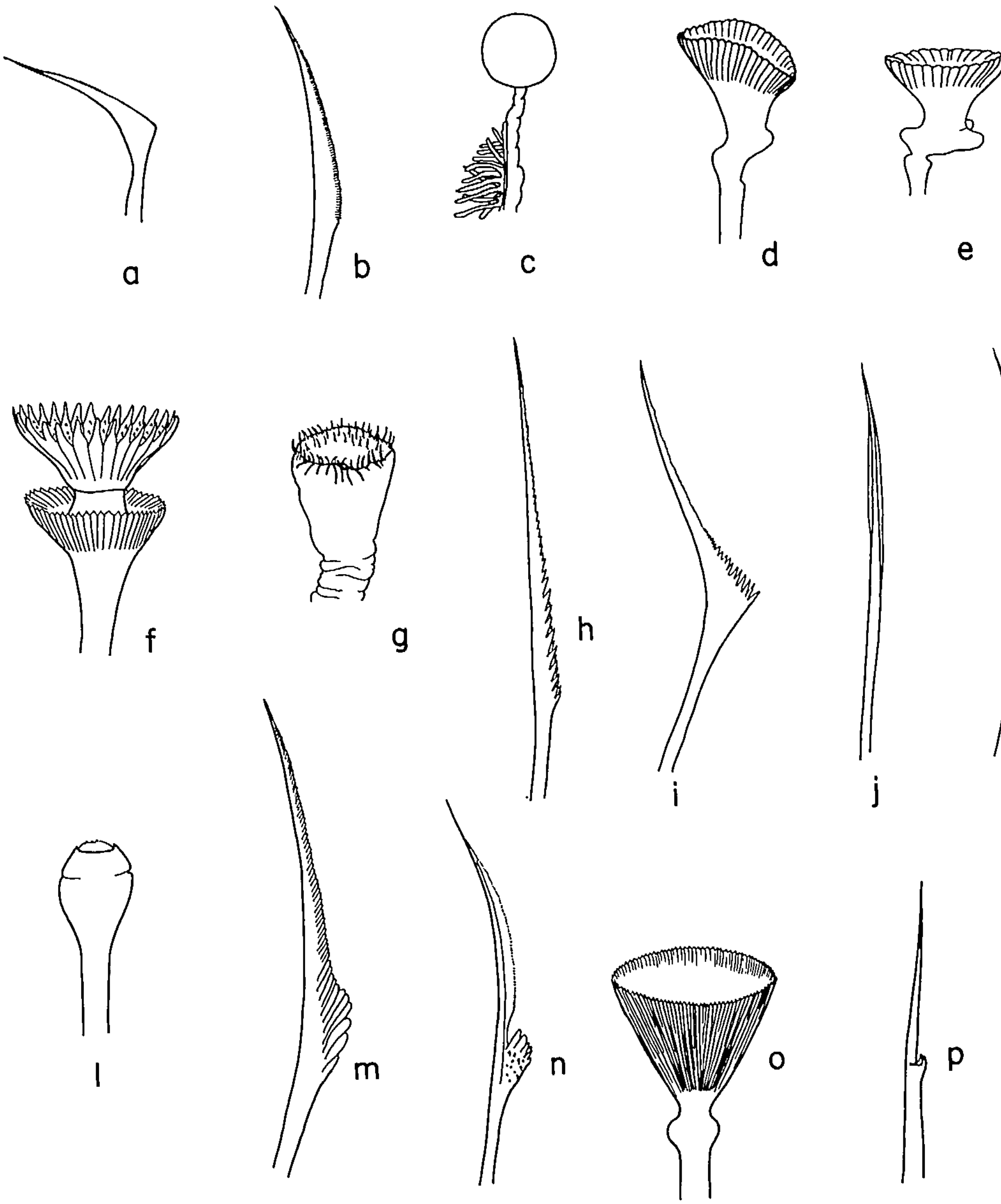
9 Operculum nearly globular, with distal brown, chitinous plate (as in Fig. 27*l*). Heavy collar setae with several proximal teeth (as in Fig. 27m) .... *Pseudochitinopoma*

Operculum funnel shaped (as in Fig. 27o). Heavy collar setae with 2 proximal teeth (as in Fig. 27p) 10

10 Operculum with conspicuous basal processes (as in Fig. 27d, e) .... *Crucigera*

Operculum without conspicuous basal processes (as in Fig. 27o) .... *Serpula*

FIG. 27. SERPULIDAE: *Apomatus geniculatus*: a, abdominal geniculate neuroseta. *A. timmsii*: b, abdominal serrated neuroseta; c, operculum. *Crucigera irregularis*: d, operculum. *C. zygophora*: e, operculum. *Hydroides*† sp.: f, operculum. *Mercierella enigmatica* Fauvel†: g, operculum; h, collar seta with coarse teeth; i, abdominal geniculate neuroseta. *Pomatoceros*† sp.: j, limbate collar seta. *Protula pacifica*: k, limbate collar seta. *Pseudochitinopoma occidentalis*: *l*, operculum; m, collar seta with many proximal teeth. *Salmacina tribranchiata*: n, collar seta with fin. *Serpula vermicularis*: o, operculum; p, collar seta with few proximal teeth. Sources: a, Moore and Bush (1904); b, d, o, p, original; c, e, k, *l*, n, CPF; f, Ushakov (1955); g, Hartmann-Schröder (1967); h–j, Fauvel (1927); m, Zibrowius (1969) [c, g, m, modified].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11 Opercular stalk not winged (as in Fig. 27g). Abdominal neurosetae geniculate (as in Fig. 27i) 12

Opercular stalk winged (as in Fig. 28a). Abdominal neurosetae like a compressed funnel, with lateral processes (as in Fig. 28c) 14

12 Collar setae with coarse teeth (as in Fig. 27h [coarser than those of thoracic notosetae]). Operculum distally flat to concave, spinose (as in Fig. 27g); stalk with oval to round cross section .... *Mercierella*†

TEN HOVE AND WEERDENBURG (1978) synonymize this genus with *Ficopomatus* Southern†.

Collar setae with fine teeth (as in Fig. 28h [similar to those of thoracic setae]). Operculum conical (as in Fig. 28o) or with brown horny cap; stalk with round cross section [not flat, ribbonlike] 13

13 Operculum conical (as in Fig. 28o). Abdominal uncini with teeth in one row .... *Vermiliopsis*†

Operculum with oval base, topped by horny, pointed cap [like fool's hood]. Abdominal uncini with teeth in 2–6 rows .... *Pseudovermilia*†

14 Collar setae large, with serrated blades (as in Fig. 28b). Operculum distally flat, with spines (as in Fig. 28a) .... *Spirobranchus*†

Collar setae very small, limbate (as in Fig. 27j). Operculum distally flat or conical, with or without distal outgrowths .... *Pomatoceros*†

Apomatus Philippi

1 Abdominal neurosetae geniculate, with smooth blades (Fig. 27a) .... *A. geniculatus* (Moore and Bush)

Abdominal neurosetae not geniculate, with serrated blades (Fig. 27b). (See also Fig. 27c) .... *A. timmsii* Pixell

Crucigera Benedict

1 Operculum with 2 basal processes and irregular distal margin [longer dorsally than ventrally, laterally compressed] (Fig. 27d) .... *C. irregularis* Bush

Operculum with 3 basal processes; distal end not laterally compressed (Fig. 27e) .... *C. zygophora* (Johnson)

Protula Risso

With about 60 [not 300] pairs of radioles. Abdominal uncini toothed [not smooth]. (See also Fig. 27k) .... *P. pacifica* Pixell

Pseudochitinopoma Zibrowius

Heavy collar setae with numerous, large basal teeth continuous with distal limbate part (Fig. 27m). (See also Fig. 27*l*) .... *P. occidentalis* (Bush)

(*Chitinopoma groenlandica* [not Mörch] in CPF, see ZIBROWIUS 1969)

Salmacina Claparède

With 3 pairs of radioles. Tubes small, slender, occurring in masses. (See also Fig. 27n) .... *S. tribranchiata* (Moore)

(*S. dysteri* var. *tribranchiata* in CPF, see HARTMAN 1969)

Serpula Linnaeus

Operculum with finely toothed distal margin (Fig. 27o). Gills and operculum usually red or red and white [may fade in preservative]. (See also Fig. 27p) .... *S. vermicularis* Linnaeus

Spirorbis Daudin

BAILEY (1969); FAUCHALD (1977); PIXELL (1912); UCHIDA (1971a, b).

After this key was completed, KNIGHT-JONES ET AL. (1980) made nomenclatorical changes for many of the listed species and added five new records (three for British Columbia and Washington, two for adjoining areas). Their key is recommended for future use.
To determine the direction in which the tube is coiling, view from above; if coiled clockwise from the aperture inwards, it is called dextral and if coiled counterclockwise (as in Fig. 28m), it is called sinistral. This character seems to be constant within the majority of taxa but occasionally may fail even at the species level (see e.g., Vine 1972). To help use the key where direction of coiling is a diagnostic character, many specimens should be inspected and Fauchald (1977) be consulted.
To remove a worm from the tube, J. H. Bailey-Brock (Department of Biology, University of Hawaii, Honolulu, HI, 96822, personal communication) suggests separating the tube from the substratum and gently chipping away the side that was attached, being careful not to damage the operculum or thorax. For identification of some species, it is necessary to use a clearing agent for the operculum, such as clove oil or glycerin, or polyvinyl lactophenol [see p. 5] for mounting the entire worm. The latter reagent dissolves the calcareous opercular plate [storage in formalin also may dissolve it]. Animals kept for many years in alcohol are difficult to clear so that details of setae may be overlooked.
To determine whether sickle setae [blades sickle shaped, distally usually serrated (as in Fig. 28k)] are present, examine setiger 3 which also has limbate setae.
The remarks under *S. ambilateralis, S. langerhansi*, and *S. nakamurai*, and the new record of *Spirorbis (Spirorbella)* sp. are based on incompleted work by K. D. Hobson. The record of *Spirorbis spinosa* from Washington by Schoener et al. (1978) is based on a typographical error (for *Spirorbis* sp.).

1 Tube usually dextral 2

Tube usually sinistral (as in Fig. 28m) 6

2 Thorax with 3 setigers. With (as in Fig. 28k) or without sickle setae. Eggs incubated in tube or operculum 3

Thorax with 3¼ setigers [setiger 4 represented only by uncini on concave side of body]. With sickle setae. Eggs incubated in tube 5

3 Collar setae with fin (as in Fig. 28e). With sickle setae. Eggs incubated in tube. Subgenus *Spirorbella* .... *Spirorbis* sp.

Collar setae without fin (as in Fig. 28h). With or without sickle setae 4

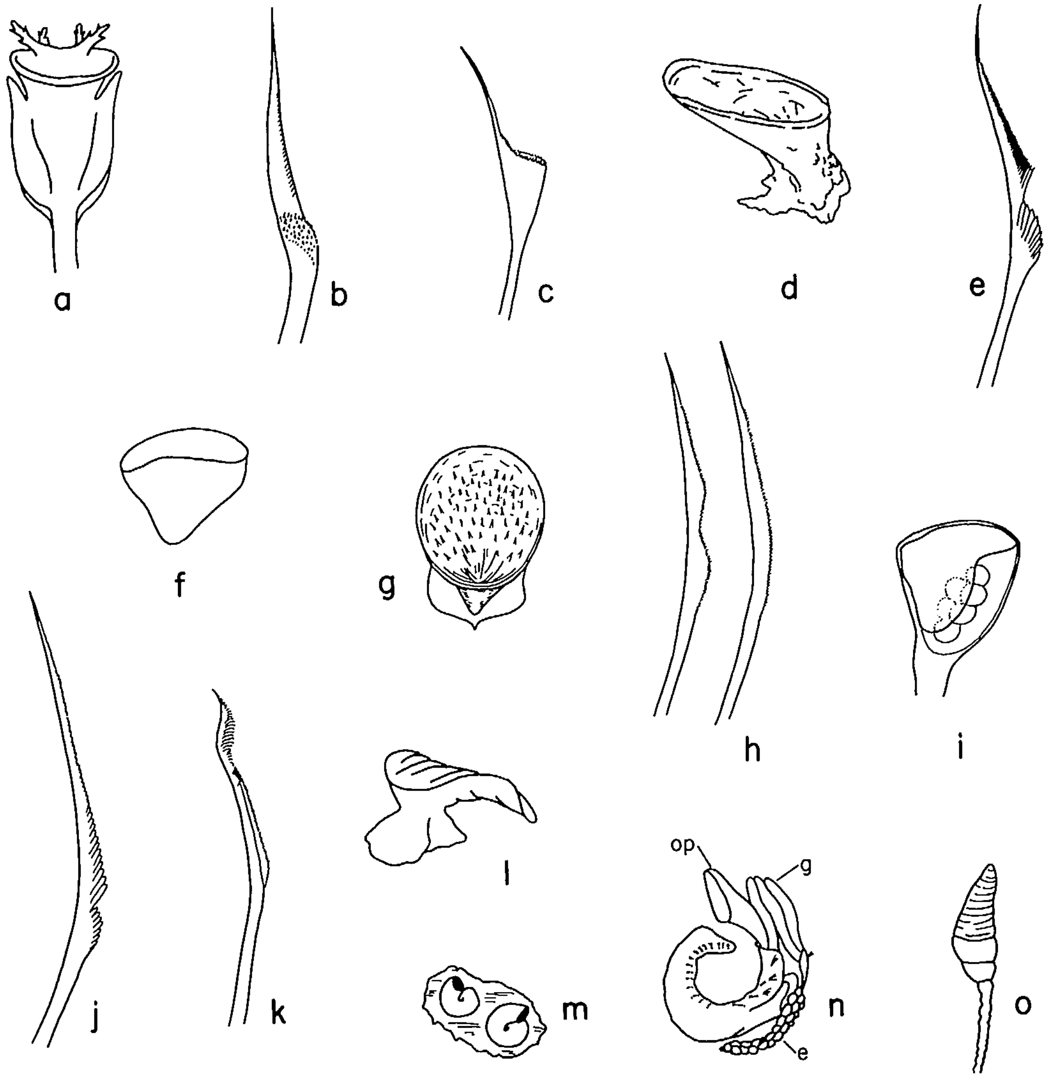

FIG. 28. SERPULIDAE: *Spirobranchus*† sp.: a, operculum; b, serrated collar seta; c, funnel-shaped abdominal neuroseta. *Spirorbis ambilateralis*: d, operculum. *S. granulatus*: e, collar seta with basal teeth. *S. langerhansi*: f, opercular plate. *S. medius*: g, operculum; h, collar setae with fine teeth. *S. moerchi*: i, operculum; j, collar seta with basal teeth. *S. nakamurai*: k, sickle seta. *S. validus*: *l*, opercular plate. *S. variabilis*: m, tube. *S.* (*Protolaeospira*) sp.†: n, entire worm with eggs, dorsolateral view [schematic]. *Vermiliopsis*† sp.: o, operculum. Sources: a–c, Hartman (1969); d, Pixell (1912); e–h, CPF; i, original; j, *l*, Bush (1904); k, Uchida (1971a); m, Rioja (1942); n, Knight-Jones et al. (1974); o, Fauvel (1927) [c, d, f, g, m–o, modified].

4 With sickle setae. Eggs incubated in operculum. Subgenus *Janua*.
Sickle setae with distally serrated blades (as in Fig. 28k) .... *S. pusilloides* Bush

Without sickle setae. Eggs incubated in tube. Subgenus *Circeis*.
Tube smooth, cylindrical, last whorl erect when crowded .... *S. spirillum* (Linnaeus)

5 Collar setae with fin (as in Fig. 28e). Subgenus *Paradexiospira*.
Sickle setae with bulge opposite serration of distal third (Fig. 28k) .... *S. nakamurai* (Uchida)
(*S. vitreus* [not Fabricius] in CPF)
Both sinistral and dextral populations occur in Washington
(POTSWALD 1965 [as *S. vitreus*]).

Collar setae without fin (as in Fig. 28h). Subgenus *Prodexiospira*.
As for the subgenus .... *S. violaceus* Levinsen
(See FAUVEL 1927; BUSH 1904)

6 Thorax with more than 3 setigers [setiger 4 represented at least by uncini on concave side of body]. Collar setae with fin. With sickle setae. Eggs incubated in tube, attached by stalk to dorsum of setiger 1 or 2 (as in Fig. 28n). Operculum with several large irregular basal processes (as in Fig. 28d). Subgenus *Protolaeospira* 7

Thorax with 3 setigers 8

7 Thorax with 3¼ setigers [setiger 4 represented only by uncini on concave side of body] .... *S. racemosus* (Pixell)

Thorax with 3¾ setigers [setiger 4 represented by uncini on both sides and notosetae on convex side of body]. (See also Fig. 28d) .... *S. ambilateralis* Pixell
On a single rock, specimens have been found with 3¼, 3½, and 3¾ thoracic setigers. This suggests that *S. racemosus* is a synonym of *S. ambilateralis*.

8 Collar setae without fin (as in Fig. 28h) 9

Collar setae with fin (as in Fig. 28e, j) 10

9 With sickle setae. Eggs incubated in tube. Subgenus *Romanchella*.
Operculum basally with 2 winglike expansions; distally concave, spinose [when unworn] (Fig. 28g). (See also Fig. 28h) .... *S. medius* Pixell

Without sickle setae. Eggs incubated in operculum. Subgenus *Leodora*.
Operculum basally with wide wings; distally convex, without spines (Fig. 28*l*) .... *S. validus* Verrill

10 With sickle setae. Thoracic uncini with single row of teeth. Eggs incubated in operculum. Subgenus *Pileolaria* 11

With or without sickle setae. Thoracic uncini with several rows of teeth. Eggs incubated in tube 13

11 Middle section of blades of collar setae finely serrated (Fig. 28e). Thoracic uncini of right side 70 [not 100] μm in length .... *S. granulatus* (Linnaeus)

Middle section of blades of collar setae coarsely serrated (as in Fig. 28j) 12

12 Operculum distally an almost regular inverted cone (Fig. 28f) .... *S. langerhansi* (Caullery and Mesnil)

PIXELL's (1912) record of this species, included in CPF, has not been confirmed and may be based on nonbreeding specimens of *S. moerchi.*

Operculum funnellike, opaque terminal plate extending on one side nearly to opercular base (Fig. 28i). Thorax without pink pigment on ventral surface. (See also Fig. 28j) .... *S. moerchi* Levinsen

13 With sickle setae (as in Fig. 28k). Subgenus *Spirorbis.* As for the subgenus .... *S. borealis* Daudin

(See HARTMAN 1969)

Without sickle setae. Subgenus *Eulaeospira.* As for the subgenus. (See also Fig. 28m) .... *S. variabilis* Bush

ARCHIANNELIDA

Table 6, fig. A–E; Fig. 29

JOUIN (1971)

Whenever possible, living specimens should be examined in order to observe the ciliation patterns. Members of the Protodrilidae and Saccocirridae must be sexually mature to be identified to species.

1 Anterior end without appendages (Fig. 29f). Without setae [except *Parapodrilus*†] .... DINOPHILIDAE

Anterior end with appendages. With or without setae 2

2 Without tentacles, with 1 pair of palps [except *Paranerilla*†], often with antennae and parapodial cirri (as in Table 6, fig. E). With simple or compound capillary setae .... NERILLIDAE

With 1 pair of tentacles, without palps, antennae, or parapodial cirri (as in Table 6, fig. A–C). With simple setae (as in Table 6, fig. C [insert]; Fig. 29b) or without setae 3

The tentacles in our usage are palps, anatomically speaking (cf. ORRHAGE 1980: 154).

3 Pygidium not bilobed (see Table 6, fig. A) .... POLYGORDIIDAE

Pygidium bilobed (as in Table 6, fig. B, C) 4

4 With cylindrical parapodia (as in Table 6, fig. C [insert]), with simple forked setae .... SACCOCIRRIDAE

Without parapodia or setae [except *Protodriloides chaetifer*] .... PROTODRILIDAE

POLYGORDIIDAE

Table 6, fig. A

Without setae [examine posterior body] .... *Polygordius*

Polygordius Schneider

Pygidium bulb shaped (as in Table 6, fig. A), with 8 indistinct lobes [not cirri]. Pigmentation lacking [when preserved in alcohol]. Body 3 cm long .... *Polygordius* sp.

An unidentified species of *Polygordius* is mentioned by Morse (1979: 252) from coarse sand off Friday Harbor, WA. A single specimen [not observed alive] was collected on Aug. 9, 1973, at 12 m, on boulders with *Laminaria* and *Macrocystis*, on the west coast of Vancouver Island, B.C. (48°55.7′N, 125°16.9′W) by B. Cooke and P. Lambert.

PROTODRILIDAE

Table 6, fig. B; Fig. 29a–d
Jouin (1970); Wieser (1957)

1 With setae or with segmental adhesive organs. Epidermis with yellowish-green inclusions. Without eyes. Tentacles solid, pointing forward (as in Fig. 29a) .... *Protodriloides*

Without setae or segmental adhesive organs. Epidermis without yellowish-green inclusions. Often with eyespots. Tentacles hollow (as in Fig. 29c), moveable in many directions .... *Protodrilus*

Protodriloides Jouin

Each setiger with 4 bifid setae (Fig. 29b). Body 8–13 mm long. (See also Fig. 29a) .... *P. chaetifer* (Remane)
(See Jouin 1966; Wieser 1957)

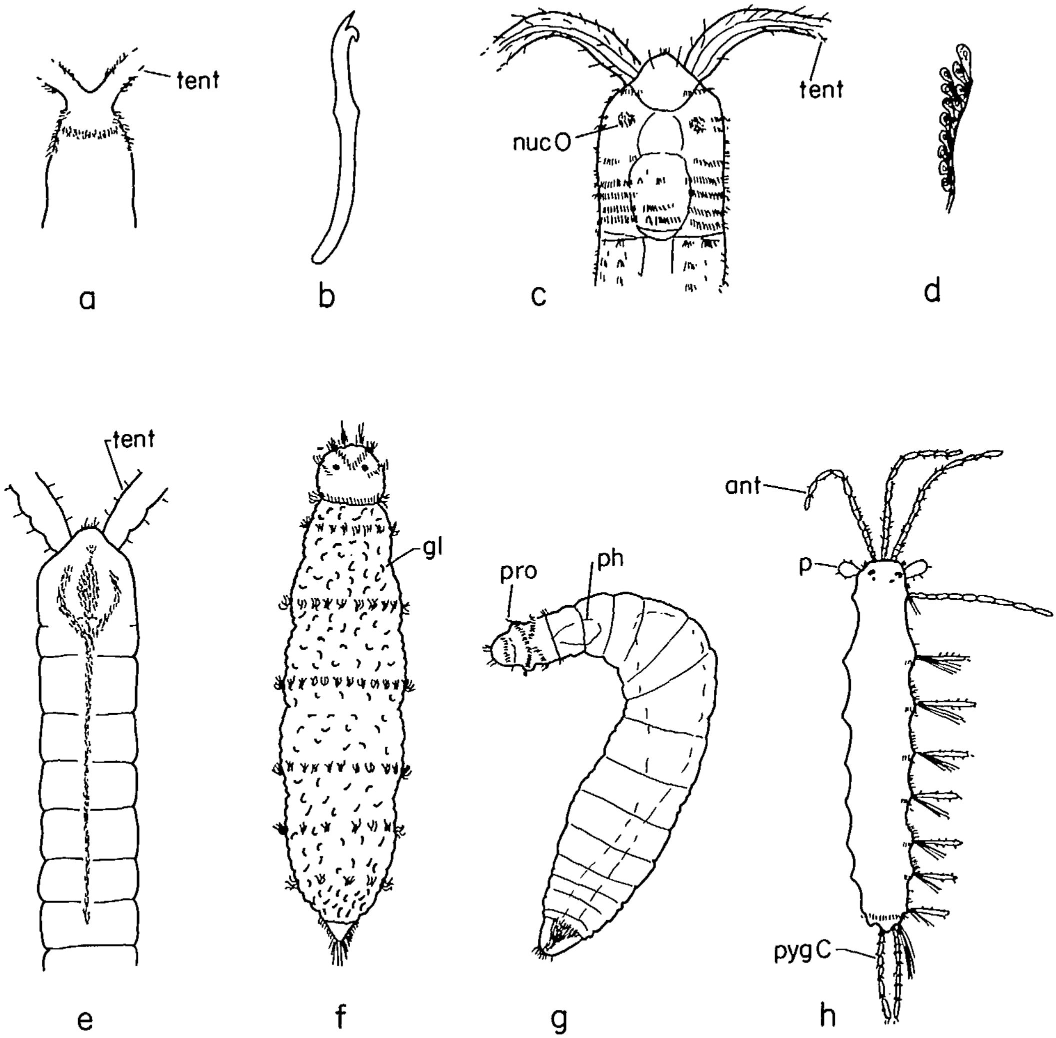

FIG. 29. PROTODRILIDAE: *Protodriloides chaetifer*: a, anterior end, dorsal view; b, bifid seta. *Protodrilus flabelliger*: c, anterior end, dorsal view. *Protodrilus* sp.: d, salivary gland. SACCOCIRRIDAE: *Saccocirrus eroticus*: e, anterior end, ventral view. DINOPHILIDAE: *Dinophilus kincaidi*: f, entire worm, dorsal view. *Trilobodrilus nipponicus*: g, entire worm, ventral view [longitudinal ciliary band not shown]. NERILLIDAE: *Nerilla inopinata*: h, entire worm, dorsal view [left side setae and cirri omitted]. Sources: a, c, g, Wieser (1957); b, Jouin (1966); d, Fauvel (1927); e, Gray (1969), f, Jones and Ferguson (1957); h, Gray (1968) [c, e–h, modified].

Protodrilus Hatschek

Salivary glands (as in Fig. 29d) are located on both sides of the digestive tract in some anterior segments.

Without eyespots. Body 2–3 mm long. Anterior end with numerous ciliary tufts and bands, with ciliated round nuchal organs (Fig. 29c). Segments 2–9 with salivary glands (as in Fig. 29d) .... *P. flabelliger* Wieser
(See WIESER 1957)

SACCOCIRRIDAE

Table 6, fig. C; Fig. 29e
JOUIN (1971)

As in family key (see also Table 6, fig. C) .... *Saccocirrus*

Saccocirrus Bobretzky

Setigers 1–7 with midventral longitudinal, ciliary band (Fig. 29e). Gonads unilateral, from setiger 11–13. Pygidium lobed (as in Table 6, fig. C) with 7–22 ridges of adhesive papillae. Worms 10–20 cm long .... *S. eroticus* Gray
(See GRAY 1969, MARTIN 1977: 103)

DINOPHILIDAE

Table 6, fig. D; Fig. 29f, g

The listed genera possess a muscular pharynx (as in Fig. 29g).

1 Prostomium trilobed (as in Fig. 29g), without eyes. With ciliated rings anteriorly. Pygidium round, truncate (as in Fig. 29g) .... *Trilobodrilus*

Prostomium rounded in dorsal view (as in Fig. 29f). With or without ciliary rings. Pygidium conical or bilobed (as in Table 6, fig. D) 2

2 Pygidium conical (as in Fig. 29f). With eyes. With ciliary rings on all segments .... *Dinophilus*

Pygidium with 2 pair of forked, adhesive lobes (as in Table 6, fig. D). Without eyes and ciliated rings .... *Diurodrilus*

Dinophilus Schmidt

Adult with 6 segments, first 5 each with 1 dorsal ciliary ring, segment 6 with 2 (Fig. 29f). Epidermal glands banana shaped, scattered on most of body, few or absent on head and posterior regions (Fig. 29f). Colorless except for 2 red eyespots. Female with unpaired ovary, male unknown ....
.... *D. kincaidi* Jones and Ferguson
(See JONES AND FERGUSON 1957)

Diurodrilus Remane

Pygidial lobes with 2 unequal forks, the longer thick and sturdy (As in Table 6, fig. D). Adults 0.4–0.5 mm long .... *D. ankeli* Ax
(See AX 1967)

Trilobodrilus Remane

Pygidium spoon shaped, ventrally with many tactile hairs and cilia [extension of ventral ciliary band] (Fig. 29g) .... *T. nipponicus* Uchida and Okuda

Only one specimen has been recorded from the area (Puget Sound). It possibly should be referred to *T. heideri* Remane†, which is closely related to *T. nipponicus* (WESTHEIDE 1967).

NERILLIDAE

Table 6, fig. E; Fig. 29h

JOUIN (1971)

Listed genera have 9 setigers.

1 All setae simple. With 3 antennae and 1 pair of palps (as in Table 6, fig. E) .... *Nerilla*

All setae composite spinigers .... *Mesonerilla*

Mesonerilla Remane

A species of *Mesonerilla* was found off San Juan Island, Washington, in summer 1979 by J. L. Norenburg, Marine Science Inst., Northeastern University, Nahant Br., Lynn, MA 01908.

Nerilla Schmidt

In the listed species, the antennae are about equal in length. Several specimens should be examined to determine the length of the antennae and cirri as they break easily.

1 Without eyes. Pygidial cirri shorter than setae of setiger 9 (as in Table 6, fig. E). Tentacular cirri only slightly longer than following cirri (as in Table 6, fig. E) .... *N. digitata* Wieser
(See WIESER 1957)

With eyes. Pygidial cirri as long or much longer than setae of setiger 9. Tentacular cirri at least twice as long as following cirri (as in Fig. 29h) 2

2 Setiger 2 with cirri shorter than setae. Setigers after first with about 9–16 setae per bundle. Pygidial cirri as long or longer than setae on setiger 9. Each segment with well-developed dorsal ciliary ring .... *N. antennata* Schmidt
(See MARCUS 1947; WIESER 1957)

Setiger 2 with cirri about as long as setae (Fig. 29h). With about 6 setae per bundle. Pygidial cirri much longer than setae on setiger 9 (Fig. 29h). Only setiger 9 with well-developed dorsal ciliary ring (Fig. 29h) ...... *N. inopinata* Gray
(See GRAY 1968)

Acknowledgments

The preparation of the present volume was preceded by the study of both our own and museum collections. We are particularly grateful for help received from our colleagues in the British Columbia Provincial Museum and the National Museum of Natural History, Smithsonian Institution. Further, R. L. Emmett and P. Lambert permitted us to include new records of material collected by them and identified by us. J. A. Blake, D. G. Cook, K. Fauchald, P. A. Jumars, J. D. Kudenov, R. O'Clair, and J. M. Orensanz made numerous comments on parts or all of earlier stages of the manuscript, and C. O. Hermans provided literature references. Our principal indebtedness, however, is to D. P. Henry, who gently inquired every now and then about the progress of the project. Later, she pointed out inconsistencies in terminology among families caused by long-standing usage among polychaete workers in general and by the present authors in particular, and especially marked the all-too-many instances of opaque phrasing in the keys proper. The uniformity in style of the present volume is, to an appreciable degree, due to her unstinting efforts. The main load of typing, both of drafts and of the final manuscript, was borne by J. Baker.

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Contribution No. 1209 from the Department of Oceanography, University of Washington, Seattle, WA, USA 98195.

Explanation of Abbreviations and Symbols

Arabic numerals indicate body segments.

ab	abdomen
ach	achaetous
acS	acicular seta
ant	antenna
ant'ly	anteriorly
antM	antennular membrane
bV	blood vessel
col	collar
colS	collar seta
cP	cephalic plate
cpd	compound
CPF	Canadian Pacific Fauna (Berkeley and Berkeley 1952)
dC	dorsal cirrus
dSO	dorsal sense organ
e	eggs
f	filament
fl	flange
g	gill
genH	genital hook
genP	genital pore
genPch	genital pouch
gl	glands
glR	glandular ring
iC	interramal cirrus
lap	lappet
lat	lateral
lF	longitudinal furrow
mL	medial lobe
mu	mucus
ne	neuropodium
neL	neuropodial lobe
neS	neuroseta
nF	neuropodial fringe
no	notopodium
noS	notoseta
nP	nephridial papilla
nucO	nuchal organ
oC	oesophageal caeca
op	operculum
p	palp
pal	palea
pap	papilla
ph	pharynx
pi	pinnule
postL	postsetal lobe
post'ly	posteriorly
preL	presetal lobe
pro	prostomium
prob	proboscis
pscp	pseudocompound
pyg	pygidium
pygC	pygidial cirrus
rad	radiole
sc	scaphe
scH	scaphal hook
set	setiger
sL	subpodial lobe
sp	spine
spl	simple
tC	tentacular cirrus
tent	tentacle
tF	transverse furrow
tL	tentacular lobe
th	thorax
thM	thoracic membrane
uL	upper lip
vC	ventral cirrus
vF	ventral fringe
vG	ventral groove
vS	ventral shield
* †	see Use of Keys, p. 6

Glossary

The terms below are defined as they are employed in the key. The usage may differ slightly from that of other authors. Words referring to position, such as "subacicular," as well as basic zoological terms, such as "segments," are usually omitted. Adjectives denoting shape, such as "clavate" that can be found in a dictionary, are not included either.

abdomen — the posterior body region in some sedentariate polychaetes, usually distinguished from the thorax by the segmental structure, or the form of the parapodia or setae (see Table 1, fig. A; Table 5, fig. A–C, E–G).

achaetous — anterior (see Fig. 9g) or posterior (see Fig. 16g, s) segments without setae.

acicula — a stout internal chitinous rod supporting the noto- or neuropodium [rarely present in sedentariate and archiannelid polychaetes].

acicular seta — a stout simple [rarely compound, as in Fig. 3k] projecting seta with more or less smooth tip (see Table 3, fig. B; Fig. 1d, 9a–c) [see also spine].

acicular uncinus — a uncinus with a long thick shaft (see Table 5, fig. C).

antenna — a paired or unpaired sensory appendage of the prostomium (see Table 1, fig. G; Table 6, fig. E; Fig. 6k).

antennular membrane — a delicate membrane between the paleae and the tentacles in the Amphictenidae (see Fig. 20f).

avicular uncinus — a beaked uncinus, with a prominent basal tooth and several small teeth above it (see Table 4, fig. D; Fig. 25t, 26j).

biramous — a parapodium with a noto- and neuropodium, each bearing setae (see Fig. 7b, 12d, 15a).

capillary seta — any thin seta tapering to a fine point (see Table 3, fig. A; Fig. 9j, 22e, g) [see also limbate seta].

cephalic cage — the long, anteriorly-directed capillary setae of the first few setigers of some Flabelligeridae (see Table 3, fig. A).

cephalic plate — the platelike anterodorsal surface of the head region in some Maldanidae (see Fig. 16d–f) and the Amphictenidae (see Table 4, fig. F).

cirrus — a projection from segments of the head region, the parapodium, or pygidium [see dorsal, interramal, tentacular, and ventral cirrus].

collar — a thin membrane on anterior or posterior segments (see Table 4, fig. B; Fig. 17m, n, 25a) or on modified setae (see Fig. 4i).

compound seta — a seta having a distal blade which articulates with the shaft (see Table 2, fig. E; Fig. 11e) [see also pseudocompound and simple seta].

dorsal cirrus — a projection emerging from the notopodium or the dorsal side of a uniramous parapodium (see Fig. 12d).

dorsal sense organ — a middorsal ridge on anterior segments in some Spionidae (see Fig. 4m).

flabellum — the first bundle of capillary setae or paleae, anterior of the gills and directed forward, in some Ampharetidae (see Fig. 21c).

forked seta — a seta with long apical prongs (see Table 3, fig. C; Fig. 1i, 3j).

geniculate seta — a seta bent like a knee (see Fig. 27a, i).

genital hook — a modified seta in males and sometimes females in some Capitellidae (see Fig. 14a).

genital pore — a modified nephridial opening (see Fig. 14h).

genital pouch — a pocketlike skin fold between neuropodia in median [sometimes anterior] segments of some Spionidae (see Fig. 4e).

gill — a respiratory structure emerging from the anterior end, segmental body wall, or parapodium (see Table 2, fig. E; Fig. 1j, 13e, 14b).

hooded hook — a hook bearing a distal hoodlike membrane (see Table 1, fig. E; Fig. 6g, *l*).

hook — a long-shafted, distally hooked seta (see Table 1, fig. E; Fig. 3a, 11e, i, 14d). It may bear 2 or more apical teeth (bi-, tridentate, etc.) [see also acicular, genital, hooded, and scaphal hooks].

interramal cirrus — a slender lobe between the notopodium and neuropodium in some Orbiniidae (see Fig. 1k).

lateral lamella — an extended postsetal lobe in the Magelonidae (see Fig. 7g).

lateral lappet — a skin fold inserted laterally on anterior segments of some Terebellidae and Trichobranchidae (see Fig. 22j, n).

lateral shield — a pad of glandular tissue in the position of the thoracic neuropodium in *Polycirrus*, sometimes covering the ventrum.

limbate seta — a capillary seta with one or two flattened margins along much of its distal half (see Fig. 22e, g).

modified or special setae — setae on one or more segments being modified and therefore of diagnostic value, e.g., acicular (Fig. 3e) and hooked (Fig. 3i, p).

nephridial papilla — a projection carrying the external opening of a nephridium. It is usually associated with the parapodium (see Fig. 11c, 22j).

neuropodial fringe — a row of papillae on the margin of the neuropodial postsetal lobe of some Orbiniidae (see Fig. 1j).

neuropodium — the ventral branch of the parapodium (see Fig. 1k, 12d, 15a).

neuroseta — a seta of the neuropodium.

notopodium — the dorsal branch of the parapodium (see Fig. 12d, 15a, 21h).

notoseta — a seta of the notopodium.

nuchal organ — a sensory structure on the posterior margin of the prostomium in the form of a pit, groove, outgrowth, or backward projection (see Table 1, fig. D, G; Fig. 3b, 17m).

oesophageal caecum — a paired glandular pouch of the oesophagus in the Arenicolidae (see Fig. 15b).

operculum — a structure of the anterior end of some sedentariate polychaetes plugging the opening of the tube when the worm retracts (see Table 4, fig. E; Table 5, fig. G; Fig. 27f).

palea — a broad flat seta, often with a metallic sheen (see Fig. 19a, 20f, 21i).

palp — a paired appendage of the anterior end. It is usually borne on the first segment (see Table 1, fig. D–H) and may appear to be inserted below the prostomium (see Table 2, fig. E; Table 6, fig. E).

parapodium — the paired segmental structure bearing the setae and often also the gills. Typically it is biramous [with a notopodium and neuropodium, each with projecting setae] (see Fig. 7m). However, in sedentariate polychaetes, the parapodial lobes are often reduced to low ridges with imbedded setae (see Fig. 15a, 21f).

pectinate uncinus — an uncinus with comblike arranged [side view] teeth of about equal size (see Fig. 20b; 22f).

pennoned seta — a special, winged seta of some Magelonidae (see Fig. 7h) and a pickaxe-shaped seta of some Sabellidae (see Fig. 25b).

pinnule — the serially arranged appendage of the radiole in the Sabellidae and Serpulidae (see Fig. 25c; 26d).

postsetal lobe — a parapodial lamella posterior to the setae (see Table 1, fig. D; Fig. 1c, 3g, 6d).

presetal lobe — a parapodial lamella anterior to the setae (see Fig. 6h).

prostomium — the anterior presegmental region (see Fig. 1g). It is often not externally recognizable in sedentariate polychaetes.

pseudocompound seta — a seta superficially appearing articulated (see Fig. 3d) or with secondarily reduced articulation [see also compound seta].

pygidial funnel or scoop — the membranous structure enclosing the anus in some Maldanidae (see Fig. 16s, 17g).

pygidial plate — the platelike posterior end in some Maldanidae (see Fig. 16r, 17e).

pygidium — the posterior postsegmental region bearing the anus and sometimes cirri or membranous structures.

radiole — the primary branch of a tentacular lobe of the Sabellidae and Serpulidae.

scaphal hook — a stout hooked seta at the base of the scaphe in the Amphictenidae (see Table 4, fig. F; Fig. 20c).

scaphe — the flattened caudal region bearing the anus in the Amphictenidae (see Table 4, fig. F).

seta — a chitinous bristle emerging from or imbedded in the parapodium [see also compound, geniculate, pseudocompound, simple, spatulate, and subspatulate; hook, palea, spine, subuluncinus, uncinus; and modified or special setae].

setiger — any segment that bears setae.

sickle seta — a seta on thoracic setiger 3 with sickle-shaped blade, often serrated, of some Spirorbinae (see Fig. 28k).

simple seta — an unjointed seta (see Fig. 1*l*, 3p, 6g, 17o) [see also compound and pseudocompound seta].

spatulate seta — a seta with distally broadly expanded margin (see Fig. 25d, g) [see also subspatulate seta].

spine — a thick acicular or spear-shaped seta (see Table 2, fig. C; Fig. 1j, 5b, 16j, 24d).

spiniger — a compound seta with a straight, pointed distal appendage.

subpodial lobe — a projection ventrad to the neuropodium of some Orbiniidae (see Fig. 1a).

subspatulate seta — a seta intermediate in form between a limbate and spatulate seta (see Fig. 26g) [see also spatulate seta].

subuluncinus — a simple seta with a stout shaft tapering to a slender distal section (see Fig. 1e)

tentacle — a [often grooved] slender appendage of the anterior end (see Table 4, fig. E, F; Table 5, fig. A–C) [also applied to the paired, not grooved, appendages of the anterior end of some Archiannelida (see Table 6, fig. A–C].

tentacular cirrus — a paired [not grooved] appendage borne on modified segments of the head region (see Table 4, fig. F).

tentacular crown — the usually stiff, pinnate filaments at the anterior end of Sabellidae and Serpulidae composed of two [usually symmetrical] tentacular lobes (see Table 5, fig. E, G).

tentacular lobe — one half the tentacular crown of the Sabellidae and Serpulidae (see Fig. 25a, 26n).

thoracic membrane — a thin fold extending from the dorsal part of the collar to the ventral side of the posterior thorax in most Serpulidae (see Table 5, fig. G).

thorax — the anterior body region in some sedentariate polychaetes, usually distinguished from the abdomen by the segmental structure, or the form of the parapodia or setae (see Table 1, fig. A; Table 5, fig. A–C, E–G).

torus — a noto- or neuropodium reduced to a ridge or fold, with imbedded uncini (see Fig. 15a, 23p).

unciniger — any segment that bears uncini.

uncinus — a flattened seta with apical teeth, usually without a shaft (see Fig. 20b, 22k, *l*) [see also acicular, avicular, and pectinate uncini].

uniramous — a parapodium without notosetae or notopodial acicula.

upper lip — the skin fold above the mouth in the Ampharetidae (see Table 5, fig. A).

ventral cirrus — a projection from the neuropodium (see Fig. 12d, 21m).

ventral fringe — a row of papillae ventrad to the neuropodium in some Orbiniidae (see Fig. 1j).

ventral shield — a glandular [usually light-colored], segmentally arranged pad ventrally in the thorax in some Terebellidae (see Table 5, fig. B) and Sabellidae.

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